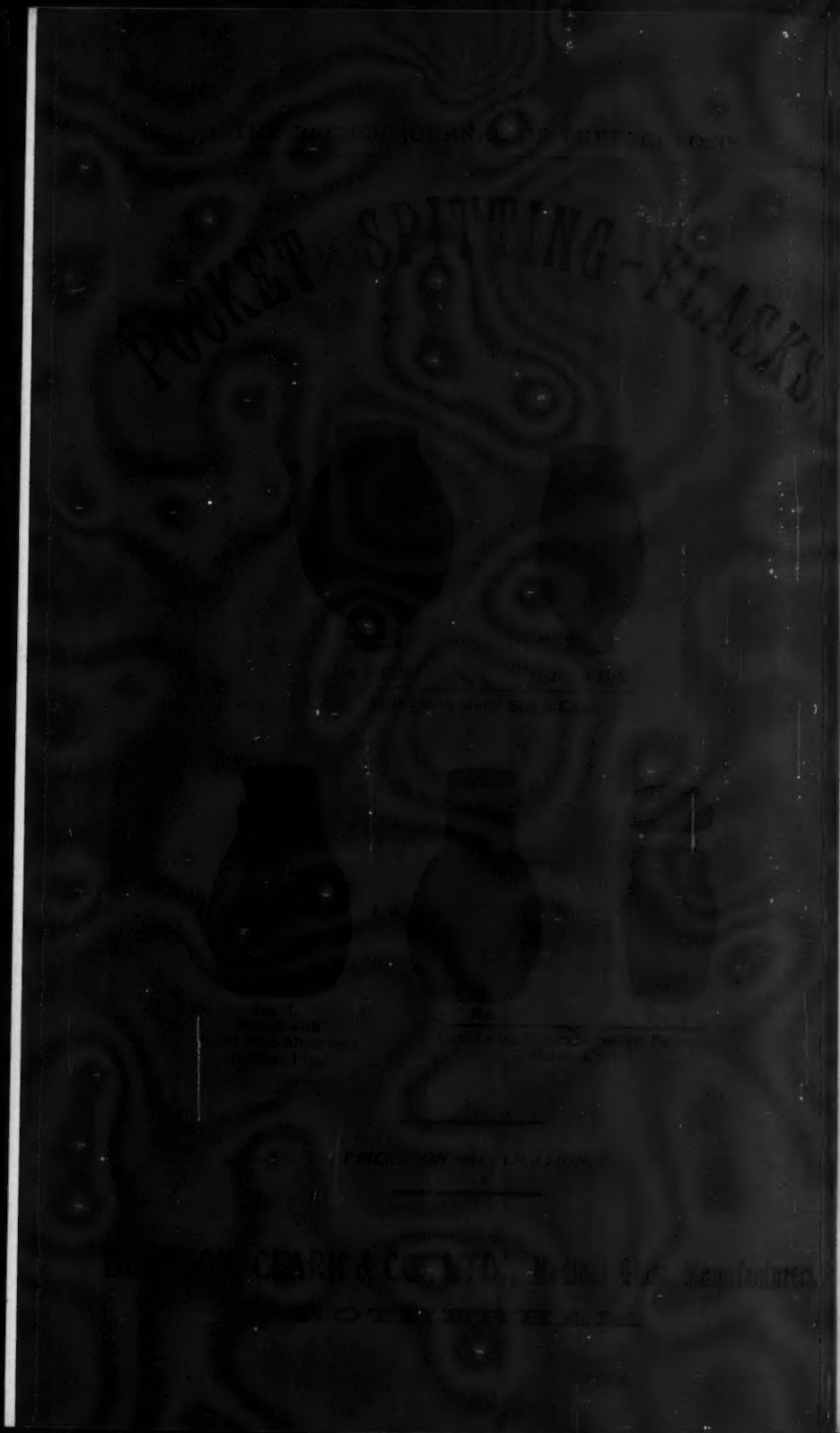
PUMPKIN SPRAYING-FLASKS

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ORIGINAL ARTICLES.

RECENT DEVELOPMENTS IN THE WORK OF THE WELSH NATIONAL MEMORIAL ASSOCIATION.

By S. LYLE CUMMINS,

C.B., C.M.G., LL.D., M.D.,

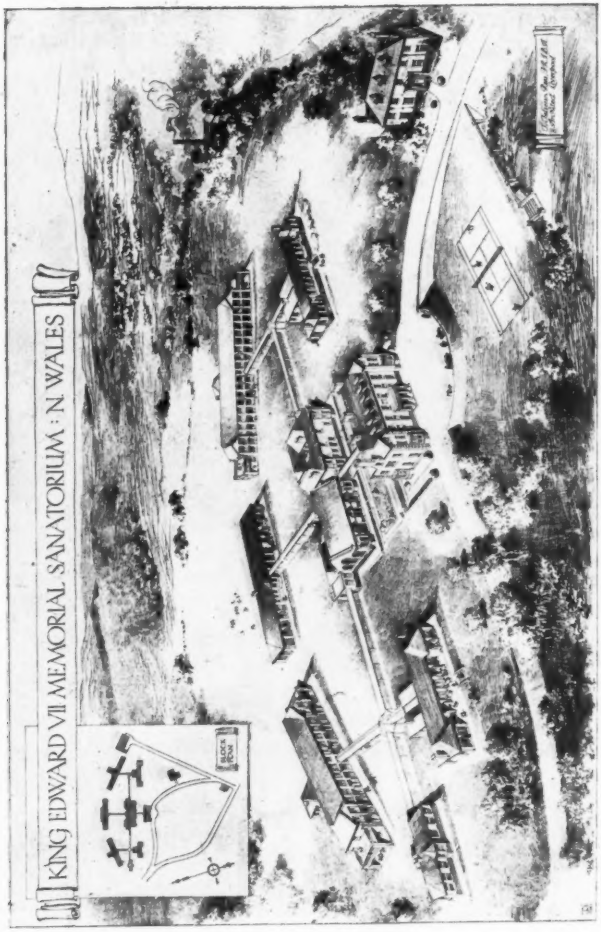
David Davies Professor of Tuberculosis, Welsh National School of Medicine, Cardiff, and Principal Medical Officer, King Edward VII.'s Welsh National Memorial Association.

Those who have followed the development of the King Edward VII.'s Welsh National Memorial Association will recollect that in Wales the tuberculosis work, carried out elsewhere by the local authorities, is entrusted to a national organization, centralizing and co-ordinating the activities of all the tuberculosis physicians throughout the Principality, and providing accommodation in residential institutions for those patients who require it on a national instead of a local basis.

The early phases of the medical work of the Welsh National Memorial are already well known through its annual reports and through the general interest that was evoked in the movement owing to the success which had attended the work of Dr. Marcus Paterson, the then Medical Director of the Association, in the application of graded exercise to the treatment of selected cases of pulmonary tuberculosis.

It would be superfluous at this time to describe over again the two magnificent sanatoria for North and South Wales, respectively situated at Llangwyfan, in Denbighshire, and at Talgarth, close to Brecon, or

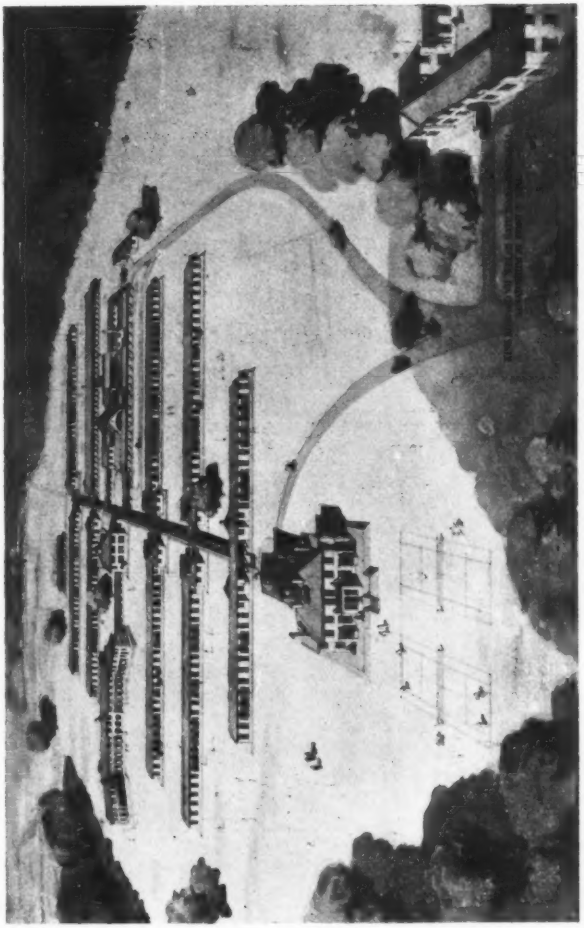
the smaller sanatoria for West Wales, situated at Llanybyther, in Carmarthenshire, as these are already well known to readers of the annual reports of the Association. But sketch-plans of the two former



SKETCH-PLAN OF THE NORTH WALES SANATORIUM FOR FEMALE PATIENTS AND CHILDREN, LLANGWYFAN, DENBIGHSHIRE.

institutions and a photograph of the latter are appended to give a general idea of the lines on which they are organized. These institutions adequately provide for cases sufficiently benign to respond to sanatorium treatment, and their success is a great tribute to the value of Dr. Marcus Paterson's methods.

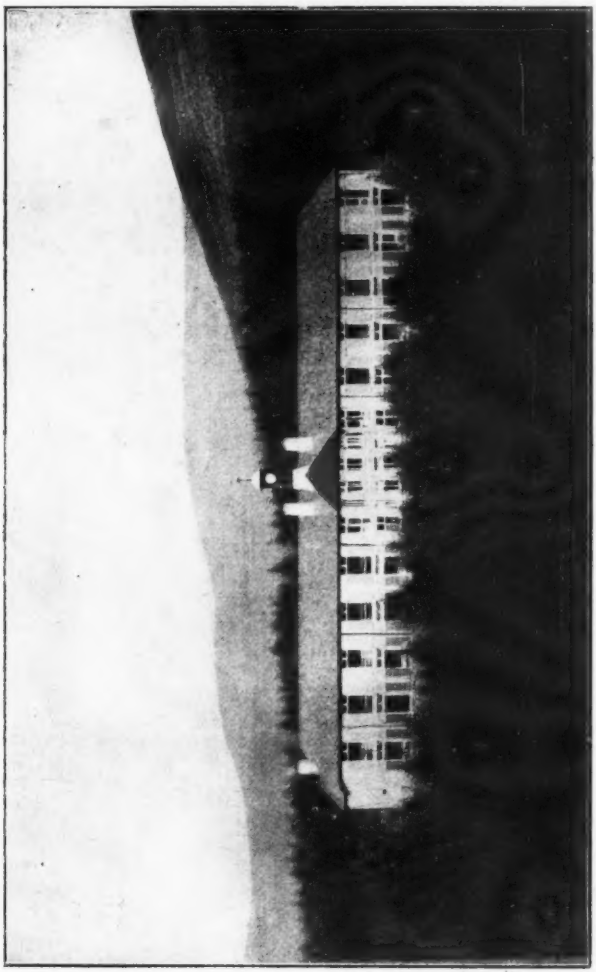
It was apparent, however, that in Wales the tuberculosis problem was complicated by the prevalence of an acute progressive clinical type, affecting, as a rule, adolescents and young adults; and that



SKETCH-PLAN OF THE SOUTH WALES SANATORIUM FOR MALE PATIENTS, TALGARTH, BRECONSHIRE.

even in later life many patients came to the notice of the tuberculosis physicians at a stage of the disease too far advanced for treatment at a sanatorium. This factor necessitated the organization of an increasing number of residential institutions for active and advanced cases. In Wales, too, as elsewhere, the urgent need for special

provision for cases of surgical tuberculosis, especially in children, has been acutely felt, and is being met by the provision of special hospitals or sections of hospitals for such cases. And while efforts to



THE WEST WALES SANATORIUM FOR FEMALE PATIENTS AND CHILDREN.

meet these immediate requirements have been constant, the Association has fully realized that the success of a tuberculosis scheme must ultimately depend on enhanced knowledge of the disease; so that some of

THE TUBERCULOSIS HOSPITAL, MACHYNLLETH.

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our most interesting developments have been in the direction of co-ordinated investigation and research.

"Chest Hospital" Developments.

Two courses were open to the Association. On the one hand, it might have been decided to use the available funds in building specially designed hospitals of the most modern type. The cost of building, however, had increased so much that the adoption of this policy would have greatly limited the number of beds that could be provided, thus leaving to be treated in their homes many cases for which treatment and nursing in a residential hospital was imperative for one reason or another. On the other hand, there was the alternative of purchasing existing buildings so situated as to meet the most urgent requirements with regard to the distribution of population; while, at the same time, providing facilities for expansion by means of pavilions when the price of building had become more reasonable. While there can be no question that, other things being equal, the ideal accommodation for the sick person is that specially designed and built to meet his requirements, there remains the hard practical fact that more is to be gained for a fixed and limited sum of money by providing reasonably good accommodation for a large number in urgent need of it than by providing what may be at the moment considered scientifically perfect accommodation for a small proportion of the total only, leaving the remainder to suffer and to spread infection under home conditions that are often unspeakably bad. Faced with this alternative, the Association has chosen, I think wisely, to obtain the most suitable existing buildings, and to modify them so as to make the best possible use of their accommodation. In certain cases it has been found possible to add more beds by the addition of specially designed hospital blocks or pavilions, fulfilling all the latest desiderata of hospital design; and this policy can be pursued in the future to a greater extent as funds become available or as building becomes cheaper, since several of the properties purchased include ample space for expansion under almost ideal conditions.

Recent hospital developments include institutions of two kinds. In the first place there are hospitals for 100 beds or more, provided with a medical superintendent in residence, and visited by the tuberculosis physicians operating in the area. To the second category belong the smaller hospitals for fifty or so beds, without a resident medical officer, but situated close to the central institute of a tuberculosis area, so that the tuberculosis physician can attend frequently and take adequate medical charge of the cases. The advantage of the former type consists in the enhanced possibilities for modern scientific work, and the economies that are effected in staff by a larger organization. The

advantages of the second group are that the patients can often be accommodated close to their homes; while the facilities afforded to tuberculosis physicians of keeping doubtful cases under their own observation or of affording temporary hospital accommodation to patients who have already and who will again be under their care at the tuberculosis institute are incalculably great.

Instances of the former type of hospital are to be found in the Adelina Patti Hospital at Craig-y-nos, opened in August last, and the Cefn Mably Hospital, close to Newport, now in course of preparation, and which it is hoped will be available for patients within the twelve months. The former is situated in what was once the beautiful home of Adelina Patti, amidst magnificent scenery, and surrounded by ample grounds. The patients fully appreciate the fact that they are placed amidst surroundings of surpassing beauty, and the fresh mountain air seems to suit them admirably. This hospital is so fortunate as to possess what can only be called an ideal ward for children—a large salon, two walls of which consist entirely of glass in the form of large windows, which can be thrown widely open, bathed in sunshine for the greater part of the day. This salon was a special feature of Craig-y-nos in the days of Madame Patti, and was designed by her for her own use. It is now occupied by children, whose cots are so arranged that they enjoy a maximum of light and fresh air, and it is seldom that one sees a happier party than its occupants. The musical tradition of the building-owner is revived when the children, trained by the Sister's-in-charge, sing all sorts of jolly songs for anyone who is so fortunate as to visit them. Another legacy from Madame Patti is a splendid organ, designed automatically to play the music of the operas that she loved, and this provides a wonderful entertainment for the patients on high days and holidays. There is, too, a complete bijou theatre, where Madame Patti used to have operatic parties, and which will serve a purpose that she, no doubt, would have thoroughly approved in providing entertainments for the patients.

The Cefn Mably Hospital is situated in what was formerly the seat of the Kemys-Tynte family—a wonderful old house with many historic associations. It is now the property of Lord Tredegar, who has placed it at the disposal of the Association on a long lease at a nominal rent; in other words, the building is practically a gift by Lord Tredegar to the Welsh National Memorial Association. As might be imagined from the fact that the house is an old one, very considerable alterations have been necessary, and a hospital block for forty male patients is being constructed to augment the accommodation. The building is beautifully situated on high ground above the Rumney River, and commands a view extending far out over the Bristol Channel. The unique historic character of the house is being carefully preserved in its outward

appearance, and this is a matter to which those who have seen the house in its original beauty cannot be indifferent. It will afford excellent accommodation close to Newport and adjoining towns.

Amongst the second group the recent developments include the Sealyham Hospital for thirty beds, situated close to Haverfordwest, and under the medical supervision of Dr. Melville Rees, the tuberculosis physician for that county, and Machynlleth Hospital, which has just been opened in Montgomeryshire, where Dr. Owen Morris, the tuberculosis physician of the county, and the Superintendent of Education and Chief Medical Lecturer of the Welsh National Memorial Association, will be able to supervise the patients from his own district.

Another feature of great importance is the new hospital block for fifty-four beds that has been built to increase the accommodation at the Meadowslea Hospital in Flintshire, and which is in every way an example of what a modern tuberculosis hospital block should be.

Surgical Tuberculosis.

For some years the surgical cases in children from South Wales have been accommodated in a special block built for the purpose at Glan Ely Hospital, close to Cardiff, where Dr. Brownlee and his staff have organized a very efficient service for cases of this kind, while adult surgical cases are accommodated in a section of the main building. At the same time, in order to serve the needs of North Wales in this respect, excellent provision has been made at Llangwyfan Sanatorium in Denbighshire, under the guidance of Sir Robert Jones and the other consultant surgeons of the Association, who have taken the greatest personal interest in this development and who visit the institution regularly, and whose services are invaluable both in operative work and in technical advice and consultation. The accommodation provided in these two institutions was, however, found to be far below the actual requirements of Wales, and it was decided to create an institution, preferably at the seaside, which should be entirely for the reception of cases of surgical tuberculosis in children. Accommodation for this purpose was found, after many efforts in other directions, in St. Bride's Castle, Pembrokeshire, which was purchased from Lord Kensington about a year ago, and which is now almost ready for the reception of cases. This beautiful building is situated right on the sea in a position which, considering the climatic conditions of South Wales, is singularly dry, and notorious for the fact that there are more "hours of sunlight" than at any other place along the south or west coast. It has been definitely recommended by the consultant surgeons that when funds are available pavilions specially suited to the needs of surgical cases shall be built on the grounds adjoining the house, but

for the time being the house itself, singularly well adapted for the purpose, is to be used for the reception of patients. This beautiful seaside property affords not only excellent conditions for the patients, but promises ample scope for the development of what must in time become a great centre for the convalescence and cure of the victims of surgical tuberculosis in Wales.

After-Treatment of Surgical Tuberculosis.

It is fully realized that the provision even of ample hospital accommodation for surgical cases cannot be held to finally solve the problem. There remains the obligation to ensure that these patients on discharge from hospital, often provided with supporting apparatus that they may n the future outgrow, or which may require repair or revision, shall be watched by persons who are thoroughly trained in the work. The excellent results obtained by Miss Hunt with her team of trained orthopædic nurses based on her hospital at Oswestry, and working through Shropshire under the supervision of the resident surgeon, have shown what can be accomplished in this direction; and the Association has now taken steps for the initiation of work on somewhat similar lines, for which the surgical blocks at Llangwyfan, in North Wales, Glan Ely, in South Wales, and St. Bride's, in South-West Wales, will be the principal centres.

Co-ordination of Clinical Investigation.

A feature of the highest value in the medical work of the Association is that all the tuberculosis physicians and medical superintendents meet once every quarter to discuss the problems that have to be faced and to decide on possible lines of progress or improvement. These meetings afford not only excellent discussions, very helpful to every member of the staff, but also give unique opportunities for deciding on lines of investigation of a collective kind. Systematic work is now in progress on the effects of selected types of tuberculin in diagnostic tests, and in the collection of statistical data relating to problems of the disease, on lines chosen as important at the meetings of the medical staff by the tuberculosis physicians themselves. It is felt that there is great scope for investigations of this kind in the future.

Research Work.

The central laboratory of the Association, located in the Welsh National School of Medicine at Cardiff, is associated with the Tuberculosis Department of the David Davies Professor of Tuberculosis, and the two organizations work as one in relation to research. The laboratories are still very small, as the needs of the Medical School are great, and building proceeds but slowly. The future, however, affords a prospect of useful developments, since the clinical material at the

disposal of the Association is very great, and Wales presents an area which is most conveniently situated for the study of many problems relating to tuberculosis as a whole.

Dr. W. H. Tytler, who has recently joined the staff of the Association on completing his work at the Medical Research Council Laboratories at Hampstead, brings to the problems of tuberculosis long training in pathology and bacteriology gained under Professor Adami in Canada and, later, at the Rockefeller Institute. He is now engaged in organizing the laboratory equipment and supplies necessary for the work which he contemplates in relation to the bio-chemical and other problems of the disease.

The President of the Association, Colonel David Davies, M.P., whose generosity and that of his sisters gave the first impetus as well as the first financial basis to the work of the Association, and who has, together with his family, also endowed the Chair of Tuberculosis in the University of Wales, is fully alive to the fundamental importance of research, and gives both his sympathy and his great business knowledge unstintingly to the furthering of the work.

Radiological Service.

Very efficient X-ray outfits have been installed in the sanatoria for North Wales and South Wales as well as in the Glan Ely Hospital. The need for radiology in the study of chest diseases, and especially in the differential diagnosis of pulmonary tuberculosis, has led to the decision to add X-ray installations to a still larger number of our hospitals, and apparatus is now being provided for the hospitals at Craig-y-nos, St. Bride's, Cymla Hospital at Neath, Brynseiont Hospital in Carnarvon, and Meadowslea Hospital in Flintshire. We have had the benefit of the advice of Mr. Thurston Holland, of Liverpool, Consultant Radiologist to the Association, in the selection of radiological equipment for these institutions, and it is confidently expected that the radiological work performed with our new outfits will be of high efficiency.

It seems certain that the opportunity afforded by this great organization will bear fruit in the future, and that problems affecting not only Wales, but the whole question of tuberculous disease, will be thoroughly investigated and, perhaps, finally settled through its activities.

THE TUBERCULOSIS WORK OF THE METROPOLITAN ASYLUMS BOARD.

By JAMES WATT,
M.A., M.D., D.P.H.,
Medical Superintendent, King George V. Sanatorium, Godalming, and Chief Medical Officer, Medical Tuberculosis Service, Metropolitan Asylums Board.

Since the establishment of the Metropolitan Asylums Board fifty-six years ago, its work in providing and managing institutions for the treatment of the sick has expanded very rapidly until now it is the principal institutional authority in London, and manages about forty institutions containing over 20,000 beds. The Board's activities in treating tuberculosis really began after the passing of the National Insurance Act, which required without delay beds for the purposes of sanatorium benefit. Temporary accommodation was provided in the Downs Sanatorium, Sutton, Surrey (366 beds), for male cases of pulmonary tuberculosis, and in 276 beds set aside for female pulmonary cases in the Northern Hospital, Winchmore Hill. Sites were purchased and plans drawn up for permanent sanatoria, which were to replace these two institutions. Their erection, however, was held up by the War, and it was not till 1922 that the Downs Sanatorium and the Northern Hospital were replaced as sanatoria.

In the meantime the Board's tuberculosis work had developed in other directions. Queen Mary's Hospital for Children, Carshalton, a general hospital for sick children, had given up an increasing number of its 810 beds to the treatment of tuberculosis, until now between 400 and 500 beds are devoted to cases of non-pulmonary or so-called "surgical" tuberculosis, occurring in children, and about 100 beds to cases of advanced pulmonary tuberculosis. For early cases of pulmonary tuberculosis in children the High Wood Hospital, Brentwood, was set aside in 1919, providing treatment and education for 308 children. The hospital is in an excellent situation in Essex. To enable children from the two last-named hospitals to benefit by a change to a dry marine climate where the annual sunshine record is high, the Millfield Convalescent Home, near Littlehampton, with its 120 beds, is now used for all forms of tuberculosis. The Princess Mary's Hospital at Margate has, since 1919, made further provision for 270 cases of non-pulmonary tuberculosis occurring in children. There had long been a pressing need in London for accommodation for adult cases of "surgical" tuberculosis. To meet this need the Board purchased the large Empire Hotel on the front at Lowestoft, refitted it, and opened it in 1922 as St. Luke's Hospital with 164 beds.

Thus a total of about 900 beds are available for non-pulmonary or "surgical" forms of tuberculosis.

Concurrently there had been a rapid development in the work of treating adult pulmonary cases. Pinewood Sanatorium in Berkshire, formerly a private sanatorium, was purchased and enlarged in 1919, and now provides 160 beds for women. For male pulmonary cases the newly-built King George V. Sanatorium, Godalming, with 232 beds, was opened in June, 1922.

Accommodation for advanced pulmonary cases was long urgently needed in London, but the opening of Colindale Hospital, Hendon, in 1920, giving 300 beds for males, relieved the situation. For females 50 beds are still reserved at the Northern Hospital and 50 at the St. George's Home, Chelsea. Further provision for advanced cases was made in 1920 by the purchase of the modern Grove Park Institution on the south-eastern outskirts of London. This would have provided accommodation for 300 more cases, but the financial stringency made it imperative for the London County Council to revise its estimates, and this fine institution stands empty. For the same reason the building of the projected sanatorium of 300 beds at East Grinstead was never proceeded with, although the site was purchased and plans prepared. The total accommodation provided by the M.A.B., and now open for pulmonary cases, adults and children, stands at 1,280 beds.

The latest acquisition to the Board's tuberculosis service is the King George V. Sanatorium, built on an ideal site three miles from Godalming, in one of the prettiest parts of Surrey. It is well sheltered on the north and east, has a sandy site, and stands at an elevation of 300 feet. The architect is Mr. Edwin T. Hall, F.R.I.B.A., who, from a wide experience in planning sanatoria, has built an institution which has already received wide commendation. There are eight pavilions for convalescent patients arranged in pairs, and suspended as it were from covered ways, which radiate from the central administration block. Each contains twenty-four beds in single, double, and eight-bedded rooms, arranged on two sides of a central corridor, and facing east and west. Every room can thus receive direct sunshine at some time of day. They are single-story buildings of 3-inch reinforced concrete walls resting on a raft of concrete, and with floors of red decolite. Each room opens on a lawn by one or more casement windows with fanlights and a double door, each half of which in its upper two-thirds is of glass, and opens independently of its lower third. On the corridor side each room has a half-glass door, a casement window, and two open fanlights.

The hospital block of forty beds is a two-story building facing west of south. The patients' rooms are all on the south side of the corridor, and are similar to those in the convalescent pavilions, except that they

have radiator heating, and open on a veranda or a balcony 5 feet wide. The central dining-hall seats 200 patients, and is heated by a pipe under each table, but above floor level. Cross ventilation is secured by horizontally-pivoted windows. The fine concert-hall can be opened up along practically both its sides, and is provided with a stage and dressing-rooms as well as a small consecrated chancel, which can be shut off from the rest of the hall by a roller shutter. A cinematograph and wireless receiving set have been fitted up in this hall. Recreation for the patients is further provided in three billiard-rooms and in day-rooms, one in each pavilion. Two workshops under qualified instructors, one for fancy leather-work, raffia-basketry, and the repair of crockery, the other for woodwork, provide an alternative to vegetable and ornamental gardening for those who are fit enough for graduated labour.

The equipment of the King George V. Sanatorium is very complete for laboratory work, X-ray examinations, laryngological examinations, and dental treatment. In fact, all that is lacking is the *early* case of pulmonary tuberculosis.

SOME COMMON SHIBBOLETHS AND SAYINGS CONNECTED WITH PULMONARY TUBERCULOSIS.

By BERNARD HUDSON,
M.D., M.R.C.P.,
Swiss Federal Diploma; Resident Medical Superintendent, English Sanatorium, Montana, Switzerland.

There is no disease around which so many sayings—some of which have become almost proverbial—have accumulated as is the case with tuberculosis of the lungs. This can be easily understood when one reflects on the frequency of the disease, its prolonged course, the tendency to relapse, and the various effects upon the psychology of the patient. However, there are certain of these sayings which have become shibboleths, of which I am going to give a short list, in the endeavour to provide some analysis, and to show that the ones I mention are frequently erroneous and oftentimes misleading to the patient. Unfortunately, many of the sayings have become so common, and are now such catch phrases, that they are commonly repeated with almost parrot-like precision to many persons who seek medical advice, when they find themselves afflicted with this disease.

The writer has lived as patient, and has worked as doctor, for many years in the Swiss mountains, and very naturally most of the remarks

here presented deal with the suitability, or otherwise, of Switzerland as a health resort for cases of pulmonary tuberculosis.

I.

"*You are not ill enough to go to Switzerland.*" This remark I have heard from patients not once but many dozens of times, and I doubt whether any more wrong, misleading, and foolish statement has ever been uttered. In the first place, leaving Switzerland out of the question altogether, it is the early case, where the lesion is still localized and small, and where the patient's health and resistance are still good, in which the most energetic measures should be taken. The patient should be clearly informed regarding the kind of disease with which he in afflicted, and be definitely told that his best chance of getting completely cured is to take the matter firmly and strongly in hand at once, and be prepared to spend a long time, if it can be possibly managed, over his cure. Being told that he is not ill enough to do this, only serves to give him a false sense of security.

II.

"*You should be cured in the place where you are afterwards going to live.*" This is a very common piece of advice to patients suffering from tuberculosis, and is used as a deterrent towards their coming out of their home district in the United Kingdom. It seems hard to believe that such a statement can be made by any sensible person. A cure in tuberculosis surely means the formation of fibrous tissue, and the scarring and shutting off of the diseased areas by the contraction and cicatrization thus obtained. This process, known as healing, is a result of reactive power and resistance in the patient, and the whole idea of treatment of the disease is to place him under circumstances where this reactive power can be stimulated and strengthened to its fullest possible extent. Why a lung cicatrized outside of England should be specially likely to break down when the individual returns to England, it is hard to fathom. The idea has probably grown up, owing, unfortunately, to the large number of "temporary cures" who return to England. Persons coming out to Switzerland for climatic treatment frequently do not stay nearly long enough for their cure to be stabilized. It is, unfortunately, the fashion to tell people to go away for three or six months, to spend a winter here or there, and they will be quite well. Many of the patients who come to Switzerland make a rapid return to health, cough and sputum diminish, weight increases, and the tired lanquid feelings disappear and are replaced by sensations of well-being and vigour. It is very hard for such persons to realize that they are not really cured, and that it is necessary for them to

prolong their treatment far beyond this apparent return to health. It is in this way that many, who may be called "temporary cures," return to England, only to break down on the resumption of a more or less normal life, in the somewhat uncertain climate of the British Isles. If it were possible for such people to remain a year or two instead of a few months, there would be a different story in many cases.

III.

"*You must not go to an altitude because you have been spitting blood.*" There is a popular idea that cases in which hæmorrhage occurs should not seek treatment in a mountain climate; and this statement requires a certain amount of analyzing, because there is some foundation for it. In the ordinary blood-spitting and early active case, a mountain climate is not at all contra-indicated, and as a rule these cases do as well as any other. The blood-spitting is simply an expression of the activity of the disease, and stops with the arrest of activity of the disease and with the general return to health of the patient. However, there is, undoubtedly, a type of hæmorrhagic case which should not be sent to the mountains, and that is the type met with usually in elderly subjects, with hard arteries and high blood-pressure, especially where the disease is of long-standing and duration, and in which large cavities are present.

IV.

"*The blood comes from the back of the throat.*" I would not like to say how many times patients have mentioned to me that, after an attack of hæmoptysis, they have been told this. By far the commonest cause of blood-spitting is pulmonary tuberculosis, and in every single case of hæmoptysis, however slight, this should automatically be considered the cause, unless one is able to conclusively prove it to be something else. A hæmoptysis, as an early symptom of phthisis, is a most valuable warning sign to the patient; if interpreted properly, it brings to light at once the nature of the trouble from which he is suffering, and should therefore enable him to take prompt and energetic measures, and give him the best chance of completely regaining his health.

V.

"*You can be cured just as well on a London balcony as in Switzerland.*" We only have to think a very short time to see the futility of this remark. The atmosphere of a large city, with its air laden with dust, smoke, and micro-organisms of all sorts and descriptions, could hardly be compared with the dry pure thin invigorating air of the Swiss Alps; and yet I have several times heard this statement from the lips of patients to whom it has been told. The work of Leonard Hill and others proves quite clearly and scientifically the difference between the

air of big cities and the air of less populated districts. His work, also, has shown to us the beneficial influence of cold, light, and altitude upon the metabolic process of the body. Again, one has only to note the greater incidence of disease and the greater death-rate of large cities, as compared with the country.

VI.

"*You must not go to an altitude because you have a weak heart.*" Very often persons who are perfectly able to stand a mountain climate and who would be much benefited thereby, are told that they must not, under any consideration, go above 2,000 or say 3,000 feet. I have met many such cases, who have come up to a higher altitude in fear and trembling, who find to their amazement, that in a short time they are better, fitter, and stronger in every way. There is, however, one class of case which should not attempt even a moderate altitude, such as 5,000 feet; and this is where there is organic heart trouble, which is barely compensated, and where the compensation tends to break down on small provocation. In the type of cardiac weakness, due to general debility, convalescence from disease, and flabbiness of the heart muscle due to the patient's general feeble condition, there is no contrary indication to the mountains—in fact, such cases do very well; the cardiac condition recovers, and the tone and strength of the heart returns. This "shibboleth," above mentioned, has been responsible in preventing many people, who would perfectly well support a moderate altitude, and who would be greatly benefited thereby, from availing themselves of this kind of climate.

THE TYPES OF TUBERCLE BACILLI CONCERNED IN SURGICAL TUBERCULOSIS.[1]

By G. R. GIRDLESTONE,

M.A., M.B., B.CH., F.R.C.S.,

Hon. Surgeon to the Wingfield Orthopædic Hospital, Oxford; and the Shropshire Orthopædic Hospital; and Hon. Assistant Orthopædic Surgeon to the Radcliffe Infirmary, Oxford.

I FEEL that this paper should begin with an apology. For this communication deals with bacteriology, and I am no bacteriologist. But though the experimental work has been done by others much of the material has come from cases of human joint and bone tuberculosis

[1] A paper read before the British Orthopædic Association, October 20, 1922.

patients under the care of members of our Association, and in particular I may mention Sir Henry Gauvain. Facts of great interest have resulted from this work, but there is much still to be found out. The papers dealing with this piece of research have been published in various journals which I fear many of us do not find time to read, so the data and conclusions may be of new interest; further sources of material may be made available for a continuance of the research;[1] so that perhaps no apology is really needed. My own interest in the matter is of very long standing. It has been revived of late in that the thorough organization of "after care" has made it possible for us to keep in touch with cases for many consecutive years, so that opportunities of recovering material at long intervals are likely to arise. I feel that the subject is of interest to all dealing with Bone and Joint Surgery, and that some of the data are suggestive as to treatment.

Early Investigation.

Long before methods of distinguishing the human from the bovine bacillus existed, there was evidence that infection from milk was a cause of tuberculosis in the young. Within a very few years of Koch's discovery of the tubercle bacillus, 30 per cent. of dairy cattle examined in Edinburgh were found tuberculous, and tubercle bacilli were found in 16 per cent. of samples of milk.

Fraser in 1912,[2] and Mitchell in 1914,[3] published papers on the rôle of bovine bacilli in bone and joint and cervical gland tuberculosis of children. Fraser compared bottle-fed with breast-fed babies, with results indicated in the following table:

TABLE I.

	Cases.	*Bovine.*	*Human.*	*Mixed.*
Bottle-fed	43	35	3	3
Breast-fed	26	7	19	—

and comparing infants from families of which a member was known to be infected with tuberculosis with those from families without such known infection:

[1] Dr. A. S. Griffith, Field Laboratories, Milton, Cambridge, is carrying on the research. He is particularly anxious to obtain further material from cases previously found infected with atypical strains, from cases of lupus, and tuberculous material removed during laparotomy.

[2] *Journal Experimental Medicine*, Baltimore, 1912, vol. xvi., p. 432.

[3] *British Medical Journal*, 1914, vol. i., p. 125.

TABLE II.

	Cases.	*Bovine.*	*Human.*
Infants from infected families ...	21	6	15
Infants from apparently uninfected families	46	43	3

The results of Fraser and Mitchell show an unusually high proportion of "bovine" infection when compared with those obtained more recently by Eastwood, F. Griffith and A. S. Griffith, by their standard methods (shortly to be detailed). However, the relative proportions of the two types seem to vary a great deal in different parts of the world. "Bovine" tuberculosis seems very rare in Paris, and common in London and New York.

Recent Methods of Classifying Tubercle Bacilli.

At Cambridge and London systematic series of tests have been applied to various strains of tubercle bacilli from cases of surgical tuberculosis by A. S. Griffith, F. Griffith, and Eastwood.[1] The bacilli were recovered either direct from the specimen (aspiration fluid, sinus discharge, granulation tissue, etc.), or through a guinea-pig.

A. CULTURAL TEST.

Cultures are raised on the egg medium and then tested on bovine serum and glycerine media (serum, agar, potato or broth).

"HUMAN."—(1) Eugonic on all media. (2) Wrinkled layers on agar, potato and broth. (3) Pigmented on suitable bovine serum.

"BOVINE."—(1) Dysgonic; three grades of growth, but best growing "bovine" strains fall distinctly below the "human" bacillus in luxuriance. (2) Not pigmented on bovine serum.

B. ANIMAL TEST: RABBITS (SUBCUTANEOUSLY INOCULATED).

"HUMAN."—*Virulence low; rabbit never dies within three months* from tuberculosis. Spleen and lymph glands seldom affected, lungs not enlarged, isolated tubercles or tuberculous masses.

"BOVINE."—*Virulence high; rabbit almost always dies within ten weeks.* Generalized tuberculosis. Spleen and lymph glands generally affected. Lungs—voluminous, studded throughout with tubercles or confluent tuberculous masses. Kidneys, beset with tubercles and nodules.

[1] *Journal of Pathology and Bacteriology*, vol. xxi., December, 1916; *ibid.*, vol. xxiii., February, 1920; *Journal of Hygiene*, Cambridge, 1916, vol. xv., p. 257; *British Journal of Tuberculosis*, October, 1917. See also Reports to Local Government Board, New Series, 1914. No. 88.

A. S. Griffith collected all the cases of human tuberculosis that have been investigated by identical methods in this country, and reported. The total number is 1,068—of these 395 are cases of bone and joint tuberculosis, and the figures are indicated in the following table :

TABLE III.

Cases of Bone and Joint Tuberculosis.

Age Period.	*Number of Cases.*	*Human.*	*Bovine.*	*Atypical.*	*Percentage Bovine.*
0 to 5	84	57	25	2	29·76
5 to 10	167	121	42	4	25·15
10 to 16	90	77	8	5	8·8
Over 16	54	48	3	3	5·5
All ages	395	303	78	14	19·7

There are two main types—the "standard human" and "standard bovine," and a group of atypical strains. The "bovine" bacillus is responsible for a large share, varying between 25 per cent. to 60 per cent. of bone and joint tuberculosis during childhood ; as the age period of the attack advances bovine infection becomes less frequent, and is rarely met with in bone disease after twenty. The "human" bacillus, while taking a considerable share of the responsibility at all ages, covers almost the whole field in adult life. Atypical strains account for a very small number of cases.

The progressive lessening of the proportion of cases from which bacilli giving "bovine" type reactions are obtained would seem to indicate, either that increasing age gives increasing resistance to bovine bacilli and that adults are immune, or that the bovine bacilli, which almost always gain access to the body in early childhood, have in the course of years lost their bovine chacracteristics.

Calmette[1] says that there is only one species affecting mammals, and that it is adaptation of the bacillus to the human or bovine host that gives rise to the two main varieties with which we are concerned. One naturally jumps to the conclusion that the "atypical" group represents bacilli of bovine origin in process of adaptation to their human environment, and that this group might well be named "transitional." And *yet* (1) such an adaptation has never been proved experimentally; (2) all three groups of bacilli conform closely to a standard—from whatever source they are recovered, and at whatever age ; (3) in the few instances where the "atypical" bacillus has been recovered from a case at two periods

[1] Calmette : "L'Infection bacillaire et la Tuberculose chez l'Homme et chez les Animaux." 2nd Edition. Paris, 1922.

with a distinct interval (in one case nineteen months), the cultural and virulence characteristics at the early and later periods have proved identical.

Although the experimental evidence is as yet entirely negative, I feel that further cultural and virulence tests of "atypical" bacillus should be carried out repeatedly over as lengthy periods in each case as possible: it may, perhaps, still be possible to recover bacilli from some of the "atypical" cases recorded by Eastwood and Griffith; if so, a record of their present test characters would have great value.

Much clinical interest lies in this possibility of the transition of the infecting strain from "bovine" to "human" type within the period of its sojourn in one human host. Does the "bovine" bacillus, which so constantly penetrates the membranes of the infant's body with cow's milk, and which is so often responsible for bone and joint tuberculosis during childhood, change in character in course of time to the "human" type? And, if so, do these bacilli of human type, but bovine origin, share with the bacilli derived directly from a human source, in the responsibility for all the manifestations of tuberculosis in later life?

In the next table A. S. Griffith gives the number of each clinical variety of case investigated and the relative frequency of the two standard types and atypical varieties of tubercle bacillus respectively in each set of cases:

TABLE IV.

Bone or Joint.	*Number of Cases.*	*Human.*	*Bovine.*	*Atypical.*
Hip	50	43	6	1
Spine	28	17	8	3
Knee	14	13	1	—
Ankle	5	5	—	—
Multiple	28	22	5	1
Other bone or joint ...	10	7	3	—
Total	135	107	23	5

Griffith emphasizes the constancy of the group characteristics. "From several of the cases more than one strain of culture has been investigated, and in each case the different strains were found to be identical in cultural characteristics and virulence." "Two cases in my series had been previously and independently investigated by Eastwood and F. Griffith; one yielded to each investigation a fully virulent 'bovine' culture. The interval between the taking of the two samples was nine months. In the other ('atypical') case the cultural and virulence characteristics were, so far as they could be compared,

identical—the interval between taking of material being about nineteen months."

Griffith also says that the atypical (or dysgonic human) bacilli are so constant in their biological characteristics as to constitute a distinct variety of tubercle bacillus. They can be readily distinguished by cultural tests from both "human" and "bovine" types,[1] and by virulence tests from the bovine type.

In another paper evidence is given of the prolonged persistence of the "bovine" characteristics in cases of genito-urinary tuberculosis.[2] One case gave "bovine" cultures in August 1912, December 1912, February 1913, and October 1913. All were typically bovine, and cultures from the later specimens showed no indication of modification in the "human" direction." Another case (age twenty) gave a "bovine" culture and had a history of tuberculous glands (with scars) *in childhood*.

From the various papers mentioned I have picked out the cases of spinal tuberculosis from the others, noting the age and the type only, in order to arrive at an estimate of the relative age incidence of the disease in the case of the respective infections. In considering these figures it should be realized that the average ages are only of relative value. The research at Cambridge was carried out from material dispatched from a number of sources, and mainly came from special hospitals for the treatment of *children* suffering from surgical tuberculosis. All ages are therefore not equally represented:

Of 130 cases of tuberculosis of the spinal column the average ages were: Human, 11·14; bovine, 5·8; atypical, 15·9.

In other tables it is shown that the "bovine" bacillus as a cause of bone and joint tuberculosis disappears after the age of twenty.

A very interesting and suggestive comparative table is that of 108 cases of cervical gland tuberculosis and 45 of lupus. In this table the proportions of "bovine" infection is very much higher, viz.:

TABLE V.

Age Period.	108 *Cases Cervical Gland (Bovine).*	45 *Cases Lupus (Bovine).*
	Per Cent.	Per Cent.
0 to 5	86·6	63·6
5 to 10	63·3	52·6
10 to 16	33·3	50·0
Over 16	25·64	22·2
	46·3	48·9

[1] *Loc. cit.*, p. 70.
[2] Eastwood and F. Griffith: *Journal of Hygiene*, vol. xv., p. 310.

and in "scrofulodermia" the figures are similar. But in both these skin conditions the large majority of strains do not give typical virulence test results, 36 out of the 45 strains both human (18) and bovine (18) showing very marked reduction of virulence.

The Occurrence of Strains of the Tubercle Bacillus of Lowered Virulence.

In only 46 of the 1,068 cases already quoted do the strains of tubercle bacilli show any clearly marked alteration of virulence. And in 44 out of the 46 the cultures were derived from cases where the skin was the main lesion. The only non-cutaneous lesions providing a train of reduced virulence being—(1) a muscular or intermuscular abscess of the thigh from a girl aged twelve, in whom a tuberculous cervical gland yielded a culture of standard virulence, and (2) a cervical tuberculous gland.

TABLE VI.

Data from Table, giving the 1,068 Cases.

	Number of Cases.	*Human.*		*Bovine.*	
		Typical.	*Attenuated.*	*Typical.*	*Attenuated.*
Lupus ...	45	5	18	4	18
Scrofulodermia	52	28	4	16	4

In lupus, 36 out of 45 are attenuated; in scrofulodermia only 8 out of 52.

A. S. Griffith[1] discusses this most interesting matter, and states: "The occurrence of attenuated strains of tubercle bacilli in scrofulodermia is of great interest and importance. Hitherto attenuated strains of tubercle bacilli have been found . . . only in lupus lesions, a tuberculous cervical gland, and an intermuscular abscess. In lupus, which is caused by tubercle bacilli of human and bovine type in about equal proportions, the great majority of the strains have shown attenuated virulence. The presence of attenuated strains in the lesions of another variety of skin tuberculosis is therefore not surprising, and the difference in proportion of attenuated to standard strains in the two diseases is probably related to differences in the situation and duration of the tuberculous lesions. In scrofulodermia the tuberculosis affects primarily the subcutaneous tissues or the deeper layers of the skin, and is of relatively short local duration, whereas in lupus the lesions are *more superficial and of greater chronicity*."

[1] Griffith: *Journal of Pathology and Bacteriology*, vol. xxiii., No. 2, February, 1920.

The attenuation of tubercle bacilli is apparently then the rule in skin lesions. Is it not possible that there may be some very real relation between this reaction between the skin and the bacilli in lupus and scrofulodermia, and the beneficial action of the sun and the wind in treatment? And may not this function be developed and used to a much greater degree?

Conclusions.

1. The bacilli fall into three groups—(1) human, (2) bovine, (3) atypical (comparatively small but quite distinct).

2. The proportion of cases for which the bovine bacillus is responsible vary to some extent with regard to the site of lesion—*e.g.*, they play a larger part in gland than in bone and joint tuberculosis; but the variation due to age differences is much more marked, their responsibility is great during the first five years of life and diminishes rapidly after the age of sixteen.

3. The various strains of bacilli in each group give consistently the reactions characteristic of that group. Strains of bacilli giving intermediate reactions are almost unknown.

4. In no instance have bovine or atypical strains, when investigated at intervals in the same case, shown change of cultural or virulence reactions toward the human. Further investigation at longer intervals is needed.

5. There is no experimental evidence that the atypical group is composed of bacilli whose characteristics are changing from bovine to human type, as a result of human environment.

6. Tubercle bacilli of lowered virulence are found exceedingly rarely except in connection with tuberculous lesions involving the skin; on the other hand, in cutaneous lesions bacilli of lowered virulence are common, and this is most marked in lupus—a condition where the more superficial layers of the skin are involved over long periods. This is a further reason for our belief that the skin is an organ particularly valuable in the contest between man and the tubercle bacillus. Scarification and inunction, or intradermal inoculation of tuberculin may prove of exceptional benefit in the treatment of all forms of tuberculosis.

THE END OF THE TETHER?

AN OPEN LETTER ON TUBERCULOSIS TO A YOUNG MEDICAL MAN.

By an Ex-University Lecturer.[1]

You are young, like myself, and, being a capable and gifted person, have taken your degree, and have your University and hospital days well behind you. You are either instructing, teaching, and treating others, or anxious to specialize in some branch of medical science. We are both interested in tuberculosis: you from the fact of reading these pages, I as a tuberculous sufferer and sanatorium patient. Very well. Will you permit me to put before you a point of view that I feel needs restating and re-emphasizing?

Do you know Conrad's tale, "The End of the Tether," the story of an old man, under the terror of gradually advancing blindness, fighting against odds for his daughter's happiness? Well, that is more or less how we are placed now—the public, doctors, patients and their friends. Medical advisers, those in charge of our great apparatus of health and clearing-houses of sickness, can only make use of partially successful methods and limited ameliorative measures. Tuberculosis, at least in its pulmonary form, when it has obtained a firm grip, appears always to run an inevitable pathological course, and that with only one end. What is the state of our knowledge? We can (1) catch and isolate the patient and partially arrest the disease; (2) alleviate the symptoms; (3) prevent to some degree. We cannot (4) definitely cure in any given case.

As regards (1) and (2) we are gradually, through State agencies and checks and private enterprise, grappling at an earlier stage of the trouble with a greater proportion of tuberculously infected persons. We are building elaborate sanatoria, carrying out acknowledged improvements in therapy, using surgical processes (pneumo-thorax, etc.), drugs (creosote, iodine, garlic, calcium salts, etc.), trying medicated injections and inhalations, sera, vaccines, auto-inoculations by exercise, etc. Few methods have negligible, most have some, none have an infallibly certain value. This contention most physicians, in their candid

[1] It is customary in such a medico-sociological journal as this to exclude anonymous communications. In the present case it seems desirable to make an exception. The above article has been prepared at the invitation of the editor by a well-known University man and classical scholar, who has, unfortunately, fallen a victim to pulmonary tuberculosis. The author has had extensive experience of sanatorium life and various forms of treatment. His paper, although unusual in form, indicates a patient's point of view, and will, we believe, be most suggestive and helpful to many medical superintendents of sanatoria, tuberculosis officers, and other medical advisers called to deal with tuberculous patients.—Editor *B.J.T.*

moments, will readily admit. Specifics, so called, especially the tuberculins, have been boomed, and proved disappointing. At the moment the study of bacteriolysis has gained a new impetus, and has some promising features; but, on the whole, the older treatment, based on a recognition and application of the four essentials (rest, fresh air, food, exercise), still holds the field. State intervention, too, granted its advantages, has decided limitations. It is apt to be a matter of chivying unfortunate victims from pillar to post, and to degenerate into card-indexing and filing. Above all, it has reacted unfavourably upon private enthusiasm, the development of the invaluable pure altruistic spirit.

As to (3) prevention, that means tackling the problem before it becomes a problem, the elimination in private and national life of all anti-health factors and civic evils. This patently waits on the coming of the social Utopia, is a part of the general betterment of conditions, and cannot be discussed here. We are left, then, with an *ad hoc* prophylaxis (such as we have got in diphtheria and smallpox) and (4) a definite cure. Of this there is little sign. No wonder doctors feel themselves in a *cul de sac*, and are greatly discouraged.

Can you imagine the result of all this upon the intelligent, think.ng, Class 2 patient? His sanatorium soon loses its rosy aspect, and ceases to be a fool's paradise. "Shades of the prison-house begin to close." He struggles as best he may by personal effort and co-operation with his doctor, clinging desperately to his *spes phthisica*, knowing he is, apart from his malady, well equipped for life's struggle, and can still do good work. Yet he feels the slow advance of an inexorable disease, sapping vitality, destroying mental concentration, robbing him of economic independence, all unrelieved by any gleam of hope. That is what he is bound to learn from his doctor's unconscious attitude to himself and others if he reflects and cerebrates at all. The circle on the pond widens; friends and relatives can only look on helplessly and utter pious aspirations.

Finally, the public is in no better case. When not occupied with other urgent problems, it is apt to treat references to the "White Scourge" as exaggerated, and merely part of a recurrent press campaign and advertising stunt by interested parties—cranks and others. The press and the public have their favourites. If the metaphor be forgiven, now their money is on cancer, now on tuberculosis, now syphilis is the dark horse, now they give orthopædics a run. At present they are backing a branch of mental pathology, the popular psycho-analysis. Great numbers of laymen are genuinely at a loss. They suspect that members of the medical profession put forward various plans and experiments because, candidly, their bread-and-butter coincide with the policy advocated. They have no agreed facts on

which to base conclusions. They realize the issues at stake, but feel the nation cannot afford a mistaken policy involving either wasteful expenditure or wasteful economy. But they would no doubt pay up cheerfully if convinced that such sacrifice were necessary. There the matter is likely to end.

What is wanted? Not money particularly, or buildings, or laboratories, or schemes, or mere State intervention, or the raw clinical material, of which there is more than enough. What is wanted is (1) men, and men of a particular type, and (2) hard work. But (1) in its entirety will include (2). Granted the men, and the problem will be solved. It is not insoluble. *Credo quia impossibile*, said one of the Fathers of his faith. It is because the problem is so hopeless and so baffling that we believe in a solution. But we must have the right men. What qualities are demanded of them? Four, I think. First, vision; second, purpose and doggedness; third, high mental equipment; fourth, the true scientific temper and detachment.

Let me say here that whilst there is no objection to medical advisers or workers who are themselves suffering from tuberculous disease, we do not want such exclusively or even primarily. They know and appreciate the intensity and danger of the malady. They are able, of course, to describe and analyze at first hand the feelings and symptoms common to it. But they must come into the problem with bias and prejudice of some sort, with a twisted mental outlook. Infected themselves, they must either import into their work a certain feverishness and hurry, for it is a race against time; or else, with an eye to their own health, carefully husband their physical resources, keep back that last ounce of energy which counts. Their scope of operations, their field of exploration, like their possible places of residence, is limited. But the true scientific worker must be *both* aloof, impartial, cool, calculating, *and* keen, tireless, unfettered, enthusiastic. It is the outside thinker and worker we most want in the study of tuberculosis. I do not think, somehow, the discoverer we are in search of will be found amongst the ranks of the tuberculously afflicted.

If you are to be such a discoverer, you must have vision. "Where there is no vision the people perisheth." The history of medicine tells how men with inadequate means, materials, books, triumphed over the prejudices and obstacles of the prevailing medical practice because they possessed an unconquerable vision. They saw the end, and kept it in view. Further, they believed in themselves. You, too, must have purpose and doggedness. There are always pessimists and croakers, and you will be confronted with the frosty air of criticism, the poohpoohs of the scientific pundits, the aloof scepticism of the medical world. This is often a good thing to restrain babblers, but there is

such a thing as professional jealousy, and the higher you go the more potent it is.

The end, then, and kept steadily in view! But how attain it? This brings us to the other qualities we suggested. Inherent capacity, a good training, a wide range of information, a well-stocked mind, you possess. Do not be satisfied; make no sharp lines of demarcation in your knowledge. You must be something of a chemist, of a physicist, of a psychologist—yes, of a humanist, too. Do not ignore workers in other fields, even the despised literary person like myself. Keep your eye on the big prizes in medicine. There are Beit Fellowships, there is even a Nobel Prize. Get abroad and study in the great European medical schools. We have a lot to learn in our tight little island yet. Above all, get rid of the notion that medical sciences are sacred mysteries, in which only the initiated may take part, where doctors are the hierophants, and all laymen must keep away from the temple precincts. That is mid-Victorian and anti-macassarish. It is quite possible—I do not say it is probable—for someone unconnected with the profession, who does not know an amœba from a tadpole, to make a valuable discovery. But something more is necessary. I am only talking to the tremendously keen man. What is absolutely indispensable to great work in research is the cultivation of the scientific mind, temper, and detachment. It is more easily described than defined. Not necessarily a gift of nature, it is capable of growing in most unpromising soil, though this involves a hard discipline. It means coming to things with fresh eyes; meticulous accuracy in observing, collecting, and arranging facts. It means a power of suspending judgment, the open mind. It means ruthless elimination of unessentials, the obliteration of provisional or pet theories, a complete retracing of steps if necessary. Above all, it means the power to assess evidence. It is no use nowadays flinging a few clinical cases into a learned journal, and so presenting a brilliant theory, which is likely to prove, when examined, only a specious improvisation. So much T.B. work seems to me to be of that character when all due allowance is made for the difficulty of freeing the evidence from the matrix in which it is embedded. It is thanks to these qualities that we have in physics our Ramsays, Kelvins, Rayleighs; in medicine our Fergusons, Listers, Mansons, Oslers They have been gifted, not with some heaven-sent faculty, but with the infinite painstaking capacity. *Natura non facit saltum.* Forgive the Latin, but remember you passed your Preliminary with flying colours. The same is true of Science—it never takes a leap. It has its curves of activity and quiescence. There is a slow accumulation of facts by individuals or groups of persons. These pass them on to others, who, perhaps, co-ordinate them. Then the conclusion implicit in all that mass of data is unfolded and flashes on the world as a new law.

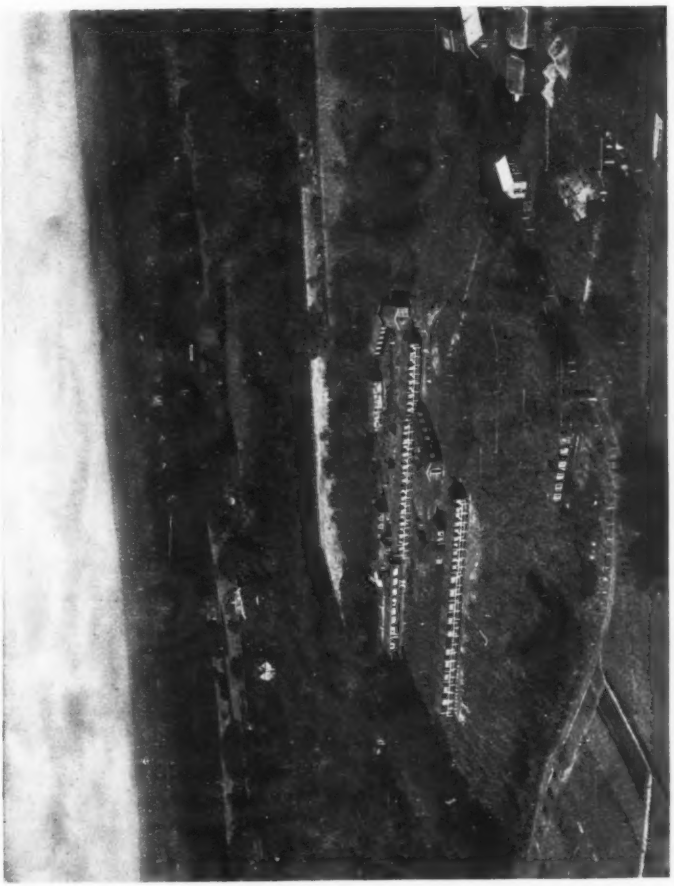
You may possibly wander in the scientific wilderness, never reaching the promised land; but at least you will have helped others to get there. You will have done your share in the fight against ignorance and darkness—have, in Arnold's words, "Fired your ringing shot and pass'd."

A final word about that scientific temper. It will be your outstanding need when you emerge from the herd, and your theories begin to command attention. Do not be easily discouraged with criticism or elated with praise. Defer to authority, but not unduly. Avoid both the worship of beards and the cult of the young. Be content, if necessary, simply to hand on the torch. You are fortunate in your research; the subject is a comparatively new one, full of possibilities. There are virgin forests of ignorance to be cleared, unmapped, untracked, awaiting the axe of the explorer. As Whitman says: "Forward, then, pioneers, O pioneers. . . ." Go on and prosper, and God-speed. I wish you luck.

ASSOCIATIONS AND INSTITUTIONS.

THE BURROW HILL COLONY, FRIMLEY.

THROUGH the courtesy of the Council and the valuable co-operation of the secretary (Miss F. Strickland) of the National Association for the Pre-



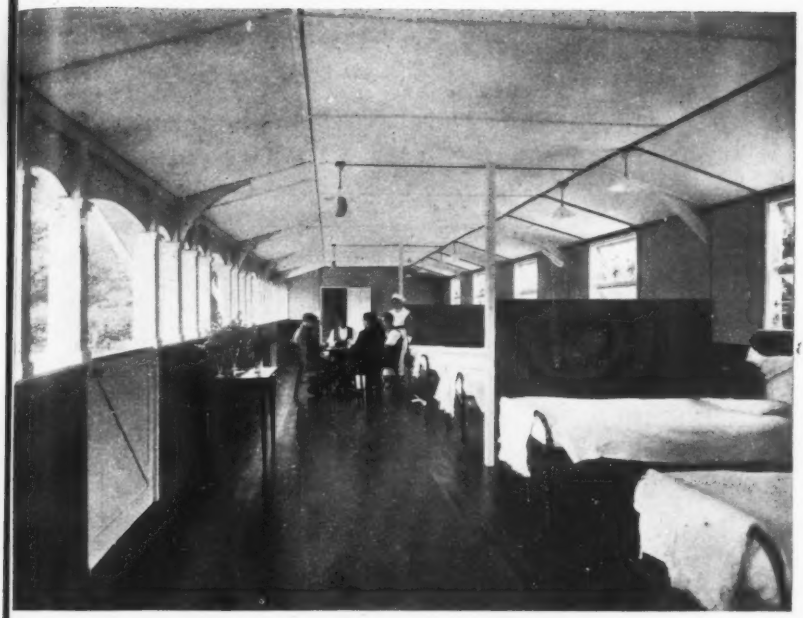
GENERAL VIEW OF THE BURROW HILL COLONY.
The photograph has been taken from an aeroplane, and shows, not only the grouping of the various sections of the Colony, but also the nature of the surrounding country.

vention of Tuberculosis, the headquarters of which are at 20, Hanover Square, London, W. 1, we are enabled to give a concise account and

present illustrations of the Burrow Hill Training Colony at Frimley in Surrey. This institution was opened last summer by the National Association, and is on the official list of the Ministry of Health as a centre for the training of tuberculous ex-service men. The training section contains sixty beds, and is provided with patients through the

THE BURROW HILL COLONY: DINING-ROOM.

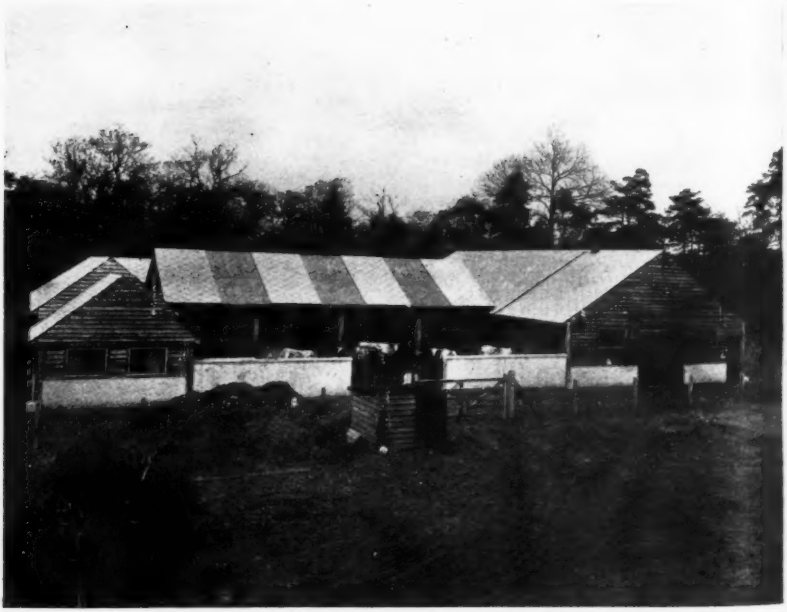
Ministry of Pensions. Courses are conducted under expert instructors in the following subjects: (1) Market gardening, including pig, poultry, and bee-keeping; (2) rural carpentry; (3) light farm work. There is also a sanatorium section, consisting of twenty beds, in which vacancies occur from time to time. Suitable cases are admitted from local authorities and on the recommendation of private practitioners and others at a weekly charge of fifty shillings. The Colony is now in full



THE BURROW HILL COLONY: THE SANATORIUM SLEEPING SHELTERS.

THE BURROW HILL COLONY: THE CARPENTER'S SHOP.

THE BURROW HILL COLONY: THE MARKET GARDEN.



THE BURROW HILL COLONY: THE FARM BUILDINGS.

working order, and a considerable amount of practical work has already been carried out by the men in training. The site of the Colony is ideal for training as well as for the treatment of sanatorium cases. The resident medical officer is Dr. A. H. Macpherson, late of Hairmyres Colony, Lanarkshire, in Scotland. His Majesty the King has graciously sent a donation of £50 towards the work of the Colony, which still stands in need of further funds to establish its position in the future. Donations and subscriptions will be gratefully received by the Secretary, N.A.P.T., 20, Hanover Square, London, W. 1, who will be pleased to give detailed information regarding the aims of the Colony and particulars as to admission.

The Ninth Annual Conference of the National Association for the Prevention of Tuberculosis will be held in the City of Birmingham on July 12 and 13, the Chairman of the Council of the Association, the Hon. Sir Arthur Stanley, G.B.E., C.B., M.V.O., presiding. The following subjects will be discussed at the four sessions: (1) Care of Advanced Cases of Tuberculosis, especially as regards Prevention of Infection. (2) Extent and Nature of Damage done by Tuberculosis derived from Infected Milk and Methods of Prevention. (3) Relative Prevalence of Tuberculosis among Workers in different Trades and Methods which are likely to Reduce the Incidence in Special Trades. (4) Notification of Tuberculosis: Proposed Amendments of Procedure. An address on "The Actual Position of the Tuberculosis Problem To-day" will be delivered on the evening of Friday, July 13. There will also be a special meeting to discuss the Work of Tuberculosis Care Committees. The Conference is open to all bodies concerned in any way with the subject of tuberculosis and to all interested persons. The fee is one guinea, which includes a copy of the Transactions of the Conference. Opportunities will be afforded Members to visit various institutions concerned with the prevention and treatment of tuberculosis in Birmingham and district, including the following: 1. The Tuberculosis Centre, where the dispensary work of the City is done. 2. Yardley Road Sanatorium (310 beds), dealing with men, women, and children. 3. West Heath Hospital, for advanced cases amongst women and certain ex-Service men, and a training colony for ex-Service tuberculous men in tin-smithing, art metal work, house repairing, furniture repairing, and upholstering. 4. Romsley Hill Sanatorium for men and women (140 beds). 5. Salterley Grange Sanatorium, near Cheltenham, for early cases (65 beds). Further particulars from the Secretary, Miss Strickland, 20, Hanover Square, London, W. 1.

NOTICES OF BOOKS.

INTRADERMIC TUBERCULIN TREATMENT.

THE quantity of literature upon tuberculin is hardly paralleled by its quality, but a recently issued monograph by Professor Sahli is among the exceptions.[1] The author combines a profound knowledge of immunology with an ability to assess clinical results. His work describes the present position of intradermic tuberculin treatment, and is to be taken as the latest pronouncement of Sahli's views. There is a discussion of great interest and clarity upon the nature of tuberculin. From the fact that all tuberculins cause a certain type of reaction, it does not follow that there is but one common fundamental substance at work; rather it is, according to Sahli, that each component antigen causes a reaction so similar to that of another that the resemblance of reaction is an illusion due to the commonness of fever as a symptom of an antigen-antibody reaction. If this view be correct, it becomes important to choose a tuberculin containing a maximum number of these antigenic principles. Sahli combats the views of Deycke and Much, considering that any virtues of their partial antigens F and N are due to contamination with the really active A, and that even so the most potent immunizing fraction (the dilute lactic acid-soluble substance) is rejected in their technique of preparation. Béraneck's tuberculin best satisfies the requirement that there should be a maximum number of antigens, which are, it is presumed, almost innumerable. The great advantage offered by the skin methods of administering tuberculin is that one can so readily see and measure the reaction and direct dosage accordingly, and the intradermic method is particularly advantageous in these respects. The characters which are to be specially observed in the papule which results are its size and the extent of the redness, and the former is probably the more worthy of measurement, as being the less fugitive sign. The reaction lasts some four to eight days, and in a typical and favourable case the succeeding injection (in a week) of the same amount demonstrates an immediate diminution of sensibility, or an increase followed by a diminution. This is taken to indicate a progressive increase of antibodies in the patient's system, and the dose is then gradually increased. Sahli describes two atypical forms of intradermic reaction: one is the nodular, in which the infiltration is unusually considerable and lasting, and which is probably of the nature of a sterile tubercle; the other is purulent —a tiny cold abscess—and occurs specially in patients with cold abscesses; these are, apparently, illustrations of the particular case's type of reaction to tuberculin. There is good evidence—such as Fellner's demonstration of the presence of antibodies in the serum of

[1] "La Tuberculinothérapie et le Traitement Intradermique." By Professor H. Sahli. Pp. 32. Traduction de MM. Piotrowski et Bickel, Clinique Médicale de Berne. Paris: A. Maloine et Fils, 1922. Price 4 frs.

von Pirquet papules—that the skin is a tissue in which antibody formation is particularly active, and this finds an interesting correlation phylogenetically with the importance of the skin as an enveloping protecting membrane. Sahli discusses very fully the important question of how far the skin reaction is reliable as an index to the general reaction. He concludes that there is for all practical purposes a parallelism between the two; so that we have in the intradermic method a means not merely of immunizing, but of immunizing in a way subject to measurement and control. The paper forms an excellent introduction to a method of treatment which is likely to come into its own.

R. G. BANNERMAN, M.D.

THE STUDY OF IMMUNITY.

Professor Much has issued a comprehensive treatise in thirteen chapters on Immunity.[1] It is written in an attractive literary and philosophical style. After a brief introduction, the author enters into an interesting discussion upon the question of the response of the living cell to stimulation. The phenomenon of "life" is still a mystery, although we are well acquainted with its various manifestations; one such manifestation is response to stimuli. The response varies not only with the nature and degree of the stimulus, but also with the kind and condition of the cell stimulated. The kinds of stimuli are numerous—*e.g.*, food, atmospheric conditions, mechanical, physical (*e.g.*, light and other radiations), chemical (toxins and poisons), as well as psychical. The influence of the degree or size of stimulus upon the character of the response is illustrated by the character of immunity conferred upon calves by inoculating them against tuberculosis. Such calves, though protected against infection conveyed in the ordinary natural manner, are unable to withstand artificial infection with massive doses of tubercle bacilli. The "laws of stimulation," as conceived by Much, are fully described. The first law—that of Arndt-Schutz—states that whilst weak stimuli excite, strong ones inhibit and very strong ones paralyze activity. The second law states that one and the same stimulus will have different effects, varying with state of the cell stimulated. The third law concerns itself with the effect of the same stimulus upon different kinds of cells. The fourth law deals with the effects of several stimuli acting simultaneously. The questions of immunity and virulence are considered in detail, and the different kinds of immunity are very adequately discussed. In subsequent chapters the author discourses on the toxins of the various diseases, such as diphtheria, tetanus, dysentery, etc.; on endotoxins, body defences, methods of increasing immunity, anaphylaxis, biological diagnosis, etc. We have nothing but praise for the interesting manner in which the book is written, but whilst the various views and opinions expounded are, as one would expect, very sound in the majority of cases, they are not invariably so. On p. 11, for instance, the author makes the following somewhat startling statement: "Amongst non-alcoholic nations the mortality from infectious diseases is not less. *The deleterious effects of alcohol are not so much on the individual himself as upon*

[1] "Die Pathologische Biologie (Immunitätswusenschaft)." Von Professor Dr. Hans Much. Vierte und fünfte Auflage. SS. 415, 8 Tafeln, und 7 Abbeldungen im Text. Leipzig: Verlag von Curt Kabitzsch. 1922. Price not stated.

his offspring." The first portion of this statement tells us very little about the influence of alcohol upon susceptibility to infectious diseases, since such susceptibility depends upon numerous other factors much more important than alcohol. The second portion, which we have given in italics, is simply not true. All clinical experience and statistical evidence undoubtedly point in the opposite direction. Indeed, authorities are not even unanimous as to whether alcohol has any influence at all upon the offspring, and statistics upon the subject are so contradictory as to preclude one from making any dogmatic statement about the matter. Another example of a statement which is against the weight of experimental evidence occurs on p. 72. "In the case of a normal healthy placenta," says the author dogmatically, "the transference of antitoxin from the mother to the fœtus is impossible. The child of an antitoxin-carrying mother is born free of antitoxin." Recent observations have shown that not only does the cord blood of the newborn infant of an antitoxin-carrying mother contain antitoxin, but the Schick test of newborn infants (before they have been put to the breast) gives results which are identical with those given by the mothers—*i.e.*, when the mothers give positive reactions the infants will give positive results, and *vice versa*. And this is the case where the placenta shows no pathological changes whatever. In spite, however, of occasional statements of this character, we are so favourably impressed with the book as a whole that we have no hesitation in recommending it to all students of immunity who are familiar with the German language.

W. M. Feldman, M.D., F.R.S. (Edin.).

THE FUNCTIONS OF THE LUNGS.

Professor Achard and Dr. L. Binet have written a useful treatise in which they describe the physiological methods which they have found of value in the clinical examination of the functions of the lung.[1] No mention is made of the ordinary methods of inspection, palpation, percussion, and auscultation. Their theme concerns the scientific routine as one finds it in a modern well-equipped clinical laboratory. Simplification of accurate physiological methods has rendered them applicable to clinics. Nevertheless, although many simple scientific methods are now available, they are not yet in general use in hospitals. Any attempt to improve this state of affairs is to be applauded. The work is divided into two parts. In the first part the authors describe the methods and apparatus for examination of the physical conditions of the thorax and lungs—*e.g.*, pneumographic tracings from the whole and from each half of the thorax, determination of the vital capacity, determination of the lung ventilation, determination of the volume of air expired and inspired per second, determination of the maximum pressure developed during inspiration and during expiration, tests (including X rays) for the condition of the diaphragm, and determination of the maximum time for voluntary apnœa. In the second part of the book the respiratory gaseous exchange is considered. Several of the simpler methods for estimation of metabolism and Fredericia's method for estimating CO_2 partial pressure in alveolar air are described. In the

[1] "Examen Fonctionnel du Poumon." By Professor Ch. Achard and Dr. Léon Binet. Pp. 155, with 66 figures. Paris: Masson et Cie, 1922. Price 12 fr.

case of each method attention is directed to the results obtained thereby from patients. The volume includes results of a fairly full research on the glycolytic function of the body, as examined by the rate of CO_2 excreted by the lung following the ingestion of a fixed amount of glucose. Numerous graphs are given illustrating this test in affections of the liver, in diabetes, in thyroid diseases, in fever, and in cancer. One feature of the book deserves especial mention—namely, it contains full references to literature. The authors are to be congratulated on being amongst the first, if not the very first, to group together in a readable form the modern scientific methods of value in the clinical examination of some of the functions of the lung.

J. Argyll Campbell, M.D., D.Sc.

A TUBERCULOSIS TREATISE.

A fine German Treatise on Tuberculosis is in course of evolution.[1] The first edition was published in 1904, in a single volume, under the editorship of Schröder and Blumenfeld, and with the title of "Handbuch der Therapie der Chronischen Lungenschwindsucht." Ten years later the scope of the publication was extended, and a much amplified edition was issued. Its title was changed to "Handbuch der Tuberkulose," and the co-operation of Professor Brauer was enlisted as an additional editor. It was to be issued as a five-volume work, but such has been its success that now, after another interval of ten years, it has been found necessary to issue the first volume of a third edition, even before the appearance of the final volume of the second edition. There are no less than forty-three contributors, all authorities of the highest reputation. It would be quite impossible to give, within the space of a short notice, an adequate account of the wonderful manner in which the dozen contributors to this volume have accomplished their respective tasks. Suffice it to say that, although the work is encyclopædic in scope, the manner in which the subject-matter of each chapter is treated is not only philosophical, but also fascinating. The sixteen chapters in this volume, which are necessarily of unequal lengths, are devoted to the history of tuberculosis, pathological anatomy, the tubercle bacillus, the paths of infection, immunity, metabolism, constitution and predisposition, individual prophylaxis, disinfection, statistics, tuberculosis in its social aspects, general diagnosis, the clinical significance of the tuberculin reaction, X rays in the diagnosis of pulmonary tuberculosis, the application of thoracoscopy and laparoscopy in the diagnosis of tuberculous affections, and, finally, the clinical classification of tuberculous diseases and the prognosis of pulmonary tuberculosis. The book is the most comprehensive and authoritative account of tuberculosis in existence, and should undoubtedly find a place in the library of every physician who takes an interest in any of the numerous divisions of the subject. The editors, the contributors, and also the publishers deserve our thanks for having given us a work of such monumental interest and importance, and we herewith offer them our congratulations.

W. M. Feldman, M.D., F.R.S. (Edin.)

[1] "Handbuch der Tuberkulose." Herausgegeben von Ludolph Brauer, Georg Schröder, and Felix Blumenfeld. Dritte Umgearbeitete Auflage. Erster Band. SS. 884. Mit 137 teils farbigen Abbildungen, 8 farbigen und 11 schwarzen Tafeln. Leipzig: Verlag von Johann Ambrosius Barth. 1923. Price £1 18s. 3d.

TUBERCULOSIS AND INDUSTRIAL HYGIENE.

Professor E. W. Hope, in collaboration with Drs. W. Hanna and C. O. Stallybrass, has produced a much needed, comprehensive, authoritative, and up-to-date handbook on Industrial Hygiene.[1] It is a monumental work, and should do much to stimulate the study and development of industrial medicine. The volume opens with an intensely interesting historical retrospect and exposition of the vital statistics of occupation and general hygienic considerations; then follow chapters dealing in detail with industrial poisonings and their effects, dust as a cause of disease, industrial infection, and occupational affections of the skin and special senses. There are also very thorough descriptions of the influence of various occupations upon health, such as mining, iron and steel manufacture, glass working, chemical manufactures, textile employment, work in compressed air, and marine service. An excellent section is devoted to the consideration of industrial physiology, and particularly the influence of fatigue. Industrial welfare in its modern development is described. The concluding chapter deals with accidents and the question of workmen's compensation. An admirable study of industrial tuberculosis is provided. It is shown that in England and Wales the tuberculosis death-rate per million living, which in 1851-60 stood at 3,479, had fallen to 2,021 by the decennium 1891-1900, and by 1913 had been further reduced to 1,340. It is, however, explained that whilst the phthisis mortality of females had fallen from 2,871 per million (in 1851-60) to 848 (in 1913), the corresponding male mortality had only fallen from 2,668 to 1178, a reduction to 30 per cent. of the former value in the case of females, but only to 44 per cent. in the case of males. The causes of occupational tuberculosis are carefully analyzed, special attention being directed to a consideration of the rôle of the various forms of dust, and particularly those containing silica. The methods of infection are enumerated, and measures for the prevention of tuberculosis are described. The question of industrial colonies for consumptive workers is also discussed. This elaborate work is a valuable addition to our all too scanty library of British works dealing with health problems of industrial life in the British Isles. The work is very effectively produced, generously illustrated, and will for long remain our standard authority on industrial hygiene and medicine.

ORGANOTHERAPY IN TUBERCULOSIS.

Dr. H. R. Harrower, in the new edition of his widely circulated work on organotherapy, which seeks to provide the medical practitioner with detailed information regarding the diagnosis of internal secretory disorders and pluriglandular therapy, has suggestive sections on "Adrenal

[1] "Industrial Hygiene and Medicine." By E. W. Hope, O.B.E., M.D., D.Sc., Medical Officer of Health for the City and Port of Liverpool; Professor in Public Health University of Liverpool, etc., in collaboration with W. Hanna, M.A., M.D., D.P.H., and C. O. Stallybrass, M.D., D.P.H., Assistant Medical Officer of Health for the City and Port of Liverpool, and Lecturer in Public Health Subjects, etc., in the University of Liverpool. Pp. viii+766, with 122 plates, appendices, and indexes of authors and subjects. London: Baillière Tindall and Cox. 1923. Price 25s. net.

Support in Tuberculosis" and "The Thyroid Factor in Tuberculosis."[1] Reference is made to Sergent's views and teaching on "l'insuffisance surrénale," and Dr. Harrower evidently agrees with him that "adrenal insufficiency is the rule in many cases of tuberculosis." The various aspects of endocrine physiology and pathology in tuberculous subjects clearly call for research. In tuberculosis either hyperthyroidism or hypothyroidism may occur, and Dr. Harrower is convinced that many cases may be helped by a judicious consideration of the thyroid factor. His suggestion certainly merits thorough inquiry.

MANUALS FOR MEDICAL ADVISERS AND WORKS OF REFERENCE.

Dr. H. O. Blanford, Medical Superintendent of King Edward VII. Sanatorium at Midhurst, has issued a forty-page booklet, "Four Sanatorium Lectures," which serve as models for simple, interesting, and helpful addresses to patients undergoing institutional treatment. It may be obtained (price 2s.) on application to the Secretary, King Edward VII. Sanatorium, Midhurst. In too many sanatoria the education of tuberculous sufferers is neglected. We commend this collection of sensible popular lectures to the consideration of tuberculosis officers and superintendents of hospitals and sanatoria, etc., responsible for the well-being and guidance of tuberculous patients.

A new edition of Dr. Tidy's practical and complete "Synopsis of Medicine" has been issued.[2] It is the most up-to-date and serviceable manual of its kind, admirably arranged, and presenting information in condensed, helpful form such as the busy practitioner will appreciate. We particularly commend this work to all tuberculosis officers and superintendents of hospitals and sanatoria who desire to keep their knowledge fresh and available. Dr. Tidy has submitted his book to thorough revision. New articles have been added dealing with Veronal and Cocaine poisoning, Vincent's Angina, Cyclical Vomiting, Cœliac diseases, Sprue, Tests for Renal Efficiency, the Physiology of Digestion, and Sensory and Motor tracts. Great care has evidently been taken to make this indispensable work as complete, reliable, and serviceable as is possible. The publishers have produced the volume in first-class style.

Dr. C. H. Würtzen has written a suggestive monograph on the clinical features of "Fatal Lung Tuberculosis."[3] It has been edited by the Danish Life Insurance Companies' Committee for sub-standard lives. In spite of the somewhat involved translation the work is full

[1] "Practical Organotherapy; The Internal Secretions in General Practice." By Henry R. Harrower, M.D., Founder of the Association for the Study of Internal Secretions, and Director of the Harrower Laboratory, Glendale, California. Fourth Edition. Pp. 416. London: Endocrines, Ltd., 72 Wigmore Street, W. 1. 1922. Price 5s. net.

[2] "A Synopsis of Medicine." By Henry Letheby Tidy, M.A., M.D., B.Ch. (Oxon)., F.R.C.P.(Lond.); Assistant Physician to St. Thomas's Hospital, etc. Third Edition, revised and enlarged. Pp. xv+985. Bristol: John Wright and Sons, Ltd. 1923. Price 21s. net.

[3] A Contribution to our Knowledge of the Clinical Course and Duration of Fatal Lung Tuberculosis," by Dr. C. H. Würtzen, Physician-in-Charge of the Œresund Hospital, Copenhagen. Pp. 43. London: Glydendal, 11, Hanover Square, W. 1. 1922. Price 2s. 6d. net.

of interest and rich in suggestions. There are valuable tables and charts, studies of statistics of former investigators, with helpful bibliographical references, and a careful presentation of the author's analysis of cases which have been under observation in the Œresund Hospital, 1906–1919. The monograph is a notable addition to the statistical study of the morbidity and mortality of pulmonary tuberculosis.

In a former issue we directed attention to Dr. Friel's practical manual on Electric Ionization. A new edition has recently appeared, enlarged both in the portion devoted to the presentation of electrical facts and the explanation of electrical terms, as well as in the descriptions of the application of ionization to morbid conditions.[1] The work contains helpful suggestions for the treatment of pyorrhœa, chronic otorrhœa, endometritis, and other chronic inflammatory conditions often met with in tuberculous subjects.

Mr. Conrad Beck has rendered students a real service by the issue of his admirable and effectively illustrated handbook on the Microscope.[2] It is a thoroughly practical guide to the correct use of this scientific instrument. The various elements in its optical construction, and the principles governing the action of the various parts, are lucidly explained. This is just the reliable, compact, and clear guide which medical students and others making use of the microscope for studies, research, or recreation will find most serviceable. Even expert microscopists will find much that will be helpful to them in these pages. The illustrations and diagrams are numerous, and are particularly instructive. The work is issued at a price which brings it within the reach of all.

The last volume of "Studies,"[3] from the Rockefeller Institute, contains reprints of forty-nine important papers dealing with the results of recent researches in pathology and bacteriology, biophysics, chemistry, experimental surgery, general physiology, and observations carried out in the hospital of the Institute. Some of these communications will be of considerable interest to students engaged in tuberculosis researches. The volume is a notable publication of over 600 pages, and all associated in any way with its preparation and publication are to be congratulated.

No. 13 of the "Reports on Public Health and Medical Subjects" contains the following bacteriological studies: 1. Review of Recent Work on Pneumococci, by Dr. A. Eastwood. 2. Types of Pneumococci, by Dr. F. Griffith. 3. Serological Differences amongst Pneumococci, by Dr. A. Eastwood. 4. Distributive and Serological Character of Influenza Bacilli, by Dr. W. M. Scott.[4]

Under the title of "Dispensary Control of Tuberculosis," a useful Year Book has been issued by the Association of Tuberculosis Clinics

[1] "Electric Ionization: A Practical Introduction to its Use in Medicine and Surgery." By A. R. Friel, M.A., M.D., F.R.C.S.I., Aural Specialist Lissonia and Almeric Paget Ionization Clinics for Otorrhœa, etc. Second Edition. Pp. 132, with 43 illustrations. Bristol: John Wright and Sons, Ltd. 1922. Price 8s. net.

[2] "The Microscope: A Simple Handbook." By Conrad Beck. Pp. 144. London: R. and J. Beck, Ltd., 68, Cornhill, E.C. 3. 1921. Price 2s. 6d. net.

[3] "Studies from the Rockefeller Institute for Medical Research." Reprints. Vol. XLIII. Pp. vi+641. New York: The Rockefeller Institute for Medical Research.

[4] The Reports on Public Health and Medical Subjects are issued by the Ministry of Health, and published by H.M. Stationery Office. The price of No. 13 is 2s. 6d. net.

of Greater New York.[1] It contains illustrations, map, statistics, and much information regarding the Service of Tuberculosis Clinics in Manhattan and Bronx Boroughs of New York.

The Association of British Chemical Manufacturers have rendered a notable service by the issue of a Directory of their Members and a List of their Manufactures.[2] This effectively arranged work should be of much value to Heads of Hospitals and Sanatoria as a reliable work of reference.

We have received a copy of the famous Merck's Year Book, of which, before the War, an edition in English was issued.[3] Vol. XXV. contains nearly 500 pages, and is arranged with the customary thoroughness. There are numerous references to new preparations which have been used in the treatment of tuberculosis.

Under the title of *Medicine* there has recently appeared a new quarterly which aims at providing authoritative analytical reviews of General Medicine, Neurology, and Pediatrics. This new periodical has made a most promising start, and we wish it much success.[4]

The Journal of Clinical Research, the official organ of the Clinical Research Association, which has been in abeyance during and since the war, has now been reorganized and restarted, and with No. 1 of Vol. IX. a new volume has been entered upon. The Journal provides articles, notes, instructions, reviews, abstracts, and book notices, all of which will be helpful to the clinician.[5]

The Committee of the American National Jewish Hospital for Consumptives have issued from their Research Department a new volume of Studies on Tuberculosis.[6] The publication consists of reprints of nineteen valuable papers.

The United States Public Health Service has recently issued a Bulletin containing eight studies by Dr. Edward Francis and others on "a new disease of man" designated "Tularæmia."[7]

[1] The headquarters of the Association of Tuberculosis Clinics is at 10, East 39th Street, New York City.

[2] "The Association of British Chemical Manufacturers' (Incorporated) Official Directory of Members with Classified List of their Manufactures." London: Association of British Chemical Manufacturers, 166, Piccadilly, W. 1. 1923. Price 10s. 6d.

[3] E. Merck's "Jahresbericht: Über Neuerungen auf den Gebieten der Pharmako-Therapie und Pharmazie." Pp. 492. Darmstadt: E. Merck, Chemische Fabrik. 1922.

[4] *Medicine* is edited by Professor David L. Edsall of Harvard and Professor John Howland of Johns Hopkins, with Dr. Paul D. White of the Massachusetts General Hospital as Associate Editor, and is published quarterly by Williams and Wilkins Company, Baltimore, U.S.A. Subscription per volume, $5.50.

[5] *The Journal of Clinical Research* is published quarterly by the Clinical Research Association, Ltd., Watergate House, York Buildings, Adelphi, W.C. 2. Price 1s. each number.

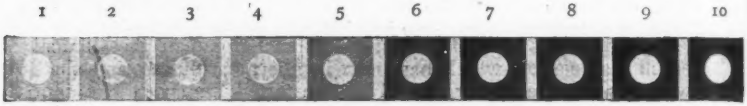
[6] "Contributions to the Study of Tuberculosis," by Research Department, National Jewish Hospital for Consumptives. Vol. III. Denver, Col., U.S.A. 1922.

[7] "Tularæmia." Washington: United States Public Health Service. Bulletin No. 130. March, 1922.

PREPARATIONS AND APPLIANCES.

THE PIGMENTOMETER.

On the suggestion of Dr. A. Niven Robertson, Messrs. Hawksley and Sons have introduced The Pigmentometer.[1] This scale provides means for the recording of the degree of skin pigmentation induced by light therapy. It will be found of value by all who employ natural heliotherapy or who use ultra-violet light (quartz mercury vapour lamp, tungsten arc lamp, etc.). In the treatment of surgical tuberculosis by natural or artificial sunlight the pigmenting power of the patient



THE PIGMENTOMETER.
Size when folded, 4¼ *by* 3½ *in.*

is regarded by many authorities as an index to its therapeutic value, and to the patient's powers of resistance to the disease. By the use of the Pigmentometer one can estimate the rate and degree of pigmentation, and also the rate and extent of depigmentation during cessation of treatment. The scale can also be applied to estimate the degree of pigmentation of the skin in all diseases in which skin pigmentation occurs—*e.g.*, Addison's disease, Basedow's disease, Hodgkin's disease, chronic intestinal stasis, uterine chloasma, bronzed diabetes, leucoderma, melanotic sarcoma, pigmented moles, pigmented scars, senile atrophy of the skin, effect of counter-irritants, arsenical pigmentation, and ordinary sunburn, etc. The form of the scale is indicated in the accompanying figure. The method of use is very simple. The scale is laid on the skin surface, and the skin seen through the aperture is compared in colour with each scale of pigment in turn until that degree of pigment scale which most closely corresponds with the colour of the skin under review is obtained. It can be used for a large number of cases, as the back of the scale can be washed.

THE UNIVERSAL INHALATOR.

Dr. Bauer has introduced a particularly neat, compact, and effective little appliance for the administration of medicaments in the form of fine vapour to the nasal and respiratory passages. It consists of a small glass receptacle into which is placed the preparation which it is desired to use. The air pressure is simply applied by means of an ordinary hand-worked rubber bellows and attachment. By means of this Universal Inhalator a remarkably attenuated vapour can be

[1] The Pigmentometer is supplied by Hawksley and Sons, scientific instrument makers, 83, Wigmore Street, W. 1. Price 3s.

obtained.[1] This simple apparatus will be found of much value in dealing with tuberculous lesions involving the throat and larynx and in alleviating inflammatory and other states where the air passages are affected, as in cases of pulmonary tuberculous and other diseases.

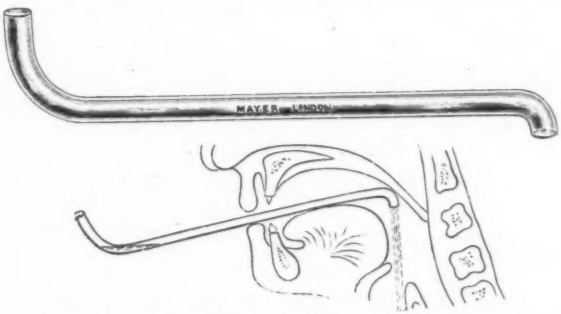
THE HORTON SOAP DISPENSER.

The authorities of hospitals, sanatoria, open-air schools, and the like, where it is desirable to study economy and maintain hygienic efficiency, will welcome the new HORTON LIQUID SOAP DISPENSER,[2] the chief features of which are indicated in the accompanying figure. This cleverly constructed receptacle can be obtained in green enamel glass and nickel plate, or in silver plate. It can be easily fixed anywhere, is unbreakable, cannot get out of order, and is durable. By its regular use infection, waste, and loss through pilfering are reduced to a minimum. It ensures a supply of reliable, attractively scented soap being always available. The Dispenser can be locked to prevent unauthorized interference.

THE HORTON SOAP DISPENSER.

INTRA-TRACHEAL MEDICATION.

Professor Leduc, of Nantes, has introduced a simple, convenient, and effective means for intra-tracheal self-directed medication. The



THE LEDUC INTRA-TRACHEAL MEDICATION TUBE.

[1] Dr. Bauer's Universal Inhalator is manufactured by the firm of J. E. Stroschein, Ltd., Chem. Fabrik., Berlin, S. O. 36, and can be obtained in this country from Thomas Christy and Co., 4-12, Old Swan Lane, Upper Thames Street, E.C. 4.

[2] The Horton Liquid Soap Dispenser is supplied by the Horton Manufacturing Company, Ltd., Rickmansworth, Herts, at prices ranging from 5s. each complete. This firm also provides excellent forms of liquid soap, jelly cleanser, and other hygienic preparations.

accompanying figure explains all.[1] There is no doubt the simple Leduc Tube will be of considerable assistance in dealing with many tuberculous cases, as well as relieving cases of influenzal and other catarrhs of the respiratory passages.

PRACTIPEDICS.

Pedestrian exercise is one of the most valuable agents in restoring the powers of the tuberculous, but it calls for careful control and scientifically directed grading. Although superintendents of sanatoria exercise strict supervision over the walks taken by their patients, it is rare to find a medical officer who systematically subjects the feet of all his patients to a thorough inspection and testing. And yet it is well known that large numbers of patients of every class are the subject of serious defects and deformities of the feet. It is interesting to note that Dr. William M. Scholl, the founder of the Scholl Manufacturing Company, the London headquarters of which are at 1-4, Giltspur Street, E.C., has founded an International School of Practipedics. Students are instructed by correspondence. The course is based on a manual, "Practipedics: The Science of Giving Foot Comfort and Correcting the Cause of Foot and Shoe Troubles." The volume contains carefully constructed sets of review questions, and the guidance given is concise, explicit, and thoroughly practical. The book is effectively illustrated. Many nurses devoting themselves to sanatorium work would be well advised to avail themselves of such a course of instruction. The Scholl Company have issued several other useful publications such as "Foot Weakness and Correction for the Physician," and "Foot Comfort and Scientific Corrections for Ailments of the Feet," which will be of service to medical advisers. The firm also provide scientifically designed supports and other appliances for the rectification or alleviation of various forms of foot trouble. In the hygienic management of the feet of the sound, as well as in the treatment of deformities, the "Pedico Foot Soap," "Foot Powder," and "Foot Balm" will be found of considerable value.[2]

DIETETIC, HYGIENIC, AND THERAPEUTIC SPECIALITIES.

Smokers, when placed under sanatorium régime, or when subjected to other therapeutic measures, if wholly deprived of their well-beloved tobacco, often become irritable and depressed. Even when smoking is contra-indicated it is sometimes the wisest course to graduate the indulgence rather than to prohibit it entirely. Fortunately the well-known firm of Alfred Dunhill have introduced the "Asorbal" HYGIENIC CIGARETTES, which admirably meet the needs of patients who desire to smoke without running the risk of prejudicing the healing of lungs, or producing irritation of the throat and respiratory passages. These high grade cigarettes have at one end a cotton-wool filter which arrests nicotine and dust. The filter is covered with a patented paper, so

[1] The Leduc Intra-Tracheal Medication Tube is supplied by Mayer and Phelps, 59-61, New Cavendish Street, W. 1. Price 1s. 6d. each or 12s. the dozen.

[2] Full particulars regarding the Scholl specialities for the feet can be obtained on application to the Scholl Manufacturing Company, 1-4, Giltspur Street, E.C. 2.

prepared as to prevent adhesion to the lips. The flavour and aroma of the cigarette, which can be obtained either as Virginias, or as Turkish, is in no way prejudiced. These cigarettes are of first-class workmanship, are made of the finest tobacco procurable, and are characterized by a delightful mildness.[1]

HORLICK'S MALTED MILK—the original—is a well-known and justly popular nutrient and stimulant, not only for delicate folk, but for the maintenance of good health in normal grown-ups and children. It provides a particularly sustaining, refreshing, and delicious food drink, rich in vitamines and other essential elements for patients in sanatoria, children in hospitals and open-air schools, and all who are delicate, tuberculously disposed, or are engaged in arduous duties. For sustaining nursing mothers it is excellent. Horlick's Malted Milk can also be procured in the form of food-tablets to be dissolved in the mouth, a very effective and convenient form for travellers, hard-worked nurses, busy medical practitioners, and other strenuous citizens.[2]

THE EDME MALT EXTRACT AND COD-LIVER OIL is an excellent preparation for tuberculous cases. The DIASTATIC MALT EXTRACT made at Mistley in Essex possesses exceptionally high digestive properties, and is manufactured only from the most carefully selected barley, and under strictly scientific and hygienic conditions. The extract is rich in diastase and peptonizing enzymes. When added to cod-liver oil it provides a palatable and nutrient product, which long experience has shown to be of exceptional benefit in securing the restoration of tuberculous patients.[3]

OVIOL is a new cod-liver oil emulsion, delicately flavoured, and to which fresh eggs have been added. It is rich in vitamins A and B, and contains an abundance of nutrients in an easily digestible form. It is an excellent preparation for tuberculous subjects.[4]

CROOKE'S COLLOSOLS are being extensively used, not only in the treatment of tuberculosis, but for many other diseases. In a previous issue we have drawn attention to the excellent results which have followed the administration of Collosol Calcium. We would also refer to the valuable series of Collosol Iron preparations and to the excellent Collosol Ferro-Malt, which can now be obtained also in combination with hypophosphites, glycerophosphates, cascara, hæmoglobin, and manganese. Collosol Iodine Oil, 3 per cent., is another preparation which will be useful in dealing with various lesions met with in tuberculous subjects. It is a deeply penetrating suspension of iodine in oil, but the preparation does not stain, blister, or irritate.[5]

[1] Dunhill's "Asorbal" Hygienic Cigarettes can be obtained in sealed vacuumized tins of fifty or in boxes of twenty-five, fifty, and one hundred. Further particulars on application to Alfred Dunhill, 30, Duke Street, St. James, S.W. 1.

[2] Full particulars regarding Horlick's Malted Milk can be obtained on application to Horlick's Malted Milk Co., Slough, Bucks.

[3] Full particulars regarding the Edme Malt and Oil Preparations can be obtained on application to Edme Limited, Broad Street House, E.C. 2.

[4] Oviol is prepared at Sapammfabriken, Christiania, Norway, and is supplied in this country by Macleans, Ltd., The Laboratories, London, W.C. 2.

[5] Full particulars regarding all the Crookes' Collosols can be obtained on application to the Crookes Laboratories, 22, Chenies Street, Tottenham Court Road, W.C. 1.

THE OUTLOOK.

ANTI-TUBERCULOSIS WORK IN CANADA.

THE Report of the Saskatchewan Anti-Tuberculosis Commission, published under the direction of the Hon. J. M. Uhrich, Minister in Charge of the Bureau of Public Health of the Province of Saskatchewan, is a ninety-four page volume containing valuable information regarding the prevalence of tuberculosis and measures which are being employed to deal with it in this district of Canada. The Report sets forth the following facts, which should be understood by the reader: "1. Tuberculosis is not now considered hereditary. 2. Infection with 'tubercle bacilli' usually takes place during childhood. 3. The most dangerous period for infection to take place is during the first three years of life. 4. The highest death-rate occurs in the first and second years of life. 5. Twenty-five per cent. of all the infection among children comes from milk and milk products. 6. Healthy adults can withstand considerable infection. 7. Principal causes of breakdown after infection are under-nourishment, impure air, overwork, insufficient rest, and attacks of other infectious diseases. 8. Tuberculosis is preventable, and, in the early stages, curable. 9. Patent medicines are of no assistance in curing the disease and are usually harmful. 10. The only known cure consists of abundance of fresh air, sunshine, wholesome food, and rest. 11. The greatest danger of infection is to children in a home where a member of the household is in the advanced stage of the disease. 12. The greatest danger to the public is the careless cougher and spitter. 13. Many people are in the advanced stage before they become aware of the presence of the disease. 14. Bad teeth, adenoids, and diseased tonsils are contributory causes in the breakdown of children previously infected. 15. The under-nourished child is the most susceptible to the disease." This suggestive and informing Report closes with a "Summary of Recommendations," which we venture to reproduce as formulating progressive views adopted in a young and vigorous department of the great Dominion of Canada: "1. Provide suitable accommodation and treatment for those with open disease. 2. Require complete disinfection of houses from which open cases have been removed. 3. Compel complete ventilation of theatres and public halls. 4. Provide meat inspection at all abattoirs and slaughter-houses. 5. Provide adequate laws to enable treatment being given to those who are unable to provide this for themselves, and to define the exact proportion of responsibility that should be borne by the province, as well as the municipality, in which indigents reside. 6. Make tuberculosis a quarantinable disease as soon as the necessary accommodation for spreaders of infection has been provided, the quarantine to be applied only when a patient fails to co-operate with the family physician or public health department in carrying out

necessary curative or hygienic measures. 7. Make provision to prevent children from coming in contact with the open cases in their homes in order to avoid infection. 8. Provide suitable preventative care for children from the homes where open cases are found. 9. Arrange for the testing of all cows supplying milk to children and for the establishment of accredited herd areas so as to encourage individual accredited herds. 10. Give special instruction to our teachers during normal school training so that they will be thoroughly informed as to the prevention of tuberculosis, the early symptoms of the disease, and the steps to be taken when suspected cases appear in the schools. 11. Examine all school children in order to eliminate sources of infection in the school and to discover causes that would predispose to breakdown. 12. Extend as far as practicable a nursing service, co-operating with family physicians, health officers, and tuberculosis clinics to all schools in the province. Where possible doctors and dentists should be employed. 13. Make provision for open-air rooms in graded schools, and in case of future construction insist on same. 14. Arrange for special rest periods and supplementary milk diets for school children physically below par. 15. Require all hospitals of fifty or more beds to provide 10 per cent. of their beds for advanced tuberculosis patients until suitable provision can be made by the Anti-Tuberculosis League. 16. Set aside a period of teaching time in the schools for health education, with special reference to tuberculosis. 17. Press federal authorities to make complete survey of Indian population and arrange for special provisions to be adopted to prevent tuberculosis among them. 18. Also press for drastic measures to be taken to eradicate tuberculosis from the herds supplying milk for children attending Indian schools. 19. Provide nurses to visit open cases and local clinics where examinations of suspects may be made. 20. Provide suitable laboratory equipment to make bacteriological examinations. 21. Induce all training schools for nurses to affiliate with the sanatorium, so as to provide tuberculosis training as part of their undergraduate course. 22. Provide post-graduate courses for physicians who desire special tuberculosis training. 23. Prevent persons from handling food in open packages unless in possession of certificates of good health. 24. Enforce compulsory reporting law *re* tuberculosis as soon as suitable facilities for treatment are provided. 25. Provide trained specialists in tuberculosis to assist in the clinic examinations. 26. Provision should be made at various centres in the province for clinics, manned by specialists, to which suspected cases could be referred by their physicians for diagnosis. 27. Provide for the services of a travelling chest expert to assist physicians in outlying districts where the establishment of clinics would not be justified. 28. Arrange for follow-up care for patients treated in the sanatorium, including visits from nurses and re-examination of patients when necessary. 29. Make provision for the care of healthy children while their mothers are undergoing treatment for tuberculosis. 30. Take every precaution against the possibility of meat from tuberculous animals being offered for sale." This enumeration of suggested anti-tuberculosis measures will, at all events, provide food for thought as well as abundant material for discussion. Many will doubtless consider that these recommendations afford evidence of a bureaucratic spirit, and certainly they cannot all be considered as being the outcome of established scientific facts.

NOTES AND RECORDS.

The Tuberculosis problem is enveloped in uncertainties and perplexities, and consequently in the organization and administration of measures aiming at prophylaxis and directed to therapeutics there are insuperable difficulties. Some interesting official statements have recently been made in the House of Commons. There are said to be no less than 455 residential institutions in England and Wales approved by the Ministry of Health for the treatment of tuberculosis. The number of beds are given as 20,555. It would appear that, on February 1, the number of persons recommended for and awaiting treatment for tuberculosis in residential institutions, from local authorities in England and Wales, was 2,902, on which date also 16,393 persons were receiving treatment. The institutions other than those under the control of Poor Law authorities approved for the treatment of tuberculosis in England are said to contain 19,240 beds, of which 3,310 are in institutions for children. It has also been recently stated officially that approximately 3,000 ex-service men are at present receiving residential treatment in institutions for tuberculosis, the average cost of treatment being £2 17s. 6d. a week for each patient, and, in addition, treatment allowances averaging £2 a week for each patient.

The ninth Session of the Trudeau School of Tuberculosis, consisting of a six weeks' course, will be held from May 15 to June 26. Instruction will be given in the clinical, laboratory, and X-ray diagnosis, treatment and prognosis of tuberculosis. Special attention will be devoted to the interpretation of X-ray findings, physical signs, differential diagnosis, laboratory technique, sputum examination, complement fixation, artificial pneumothorax, radiotherapy, tuberculin, and sanatorium construction and management. Personal instruction will be provided in all relating to the diagnosis and treatment of all forms of tuberculosis and its complications, as presented in sanatorium and private practice. The fee is $100.[1]

We have repeatedly directed attention to the remarkable work which is being carried on at Leysin in Switzerland by Dr. A. Rollier, and are glad to announce that Dr. Rollier, assisted by his medical colleagues, will hold a special course of lectures, demonstrations, and visits to clinics dealing with heliotherapy, from August 13 to 18.[2]

In connection with the scientific work of the forthcoming Scarborough Congress of the Royal Institute of Public Health, papers will be given and discussion held relating to the Tuberculosis problem.[3]

There will be a tuberculosis section in connection with the annual meeting of the British Medical Association, which is to be held at Portsmouth, July 25 to 27. The President is Sir Henry Gauvain, M.D.

[1] Particulars regarding the Trudeau School of Tuberculosis can be obtained from the Secretary, Saranac Lake, N.Y., U.S.A.

[2] Dr. Rollier's Course in Heliotherapy is open to medical practitioners of all countries free of charge, and accommodation can be provided at a nominal fee of 10 francs a day. All particulars and a prospectus of the Course can be obtained on application to the Medical Secretariat, Les Frênes, Leysin, Switzerland.

[3] The Annual Congress of the Royal Institute of Public Health will be held at Scarborough, May 16 to 21. Particulars on application to 37, Russell Square, W.C. 1.